| Installation and Maintenance Manual | IMM AGZC-1 |
|---|---|
| | Group: **Chiller** |
| | Part Number: **331376201** |
| | Effective: **January, 2010** |
| | Supercedes: **October 2008** |

# Air-Cooled Scroll Compressor Chiller

**AGZ 030CH through 190CH, Packaged**

**AGZ 030CB through 190CB, Remote Evaporator**

**R-410A**

**60 Hertz**

McQuay International
a member of DAIKIN group

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*Unit controllers are LONMARK certified with an optional LONWORKS communication module.

Manufactured in an **ISO Certified**


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# Introduction

## General Description

McQuay Air-Cooled Water Chillers are complete, self-contained automatic refrigerating units. Every unit is completely assembled, factory wired, charged, and tested. Each unit consists of twin air-cooled condensers with integral sub-cooler sections, two tandem or triple scroll compressors, brazed-plate or replaceable tube, dual circuit shell-and-tube evaporator, and complete refrigerant piping. Liquid line components include manual liquid line shutoff valves, sight-glass/moisture indicators, solenoid valves, and thermal expansion valves. Other features include compressor crankcase heaters, an evaporator heater for chilled water freeze protection, limited pumpdown during "on" or "off" periods, automatic compressor lead-lag to alternate the compressor starting sequence, and sequenced starting of compressors.

The electrical control center includes all equipment protection and operating controls necessary for dependable automatic operation. Condenser fan motors are protected in all three phases and started by their own three-pole contactors.

## Additional Manuals

This manual covers the installation, maintenance and service for dual circuit, AGZ-CH packaged or remote evaporator, scroll compressor chillers using R-410A.

Operating information is contained in the operating manual *OM AGZC*.

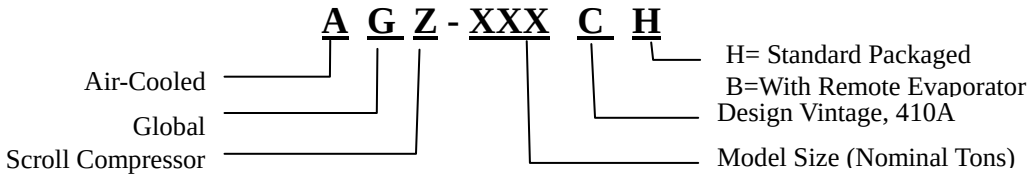
Pump package operating and maintenance information is in *IMM AGZ Pump*.

## Inspection

Check all items carefully against the bill of lading. Inspect all units for damage upon arrival. Report shipping damage and file a claim with the carrier. Check the unit nameplate before unloading, making certain it agrees with the power supply available. McQuay is not responsible for physical damage after the unit leaves the factory.

**Note:** Unit shipping and operating weights are available in the Physical Data tables beginning on page 37.

## Nomenclature




### HAZARD IDENTIFICATION INFORMATION

**⚠ CAUTION**

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

# Installation

**Note:** Installation is to be performed by qualified personnel who are familiar with local codes and regulations.

**⚠ WARNING**

Sharp edges on unit and coil surfaces are a potential hazard to personal safety.

Avoid contact with them.

## Handling

Be careful to avoid rough handling of the unit. Do not push or pull the unit from anything other than the base. Block the pushing vehicle away from the unit to prevent damage to the sheet metal cabinet and end frame (see Figure 1).

To lift the unit, 2 1/2" (64mm) diameter lifting tabs are provided on the base of the unit. Arrange spreader bars and cables to prevent damage to the condenser coils or cabinet (see Figure 2).

***Figure 1, Suggested Pushing Arrangement***

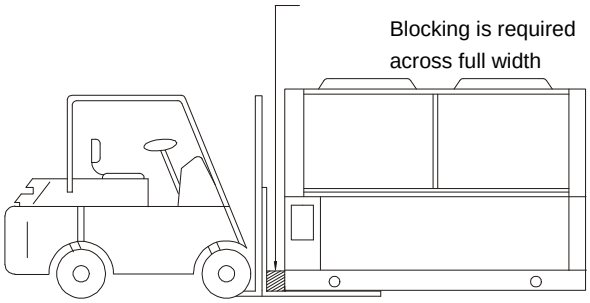
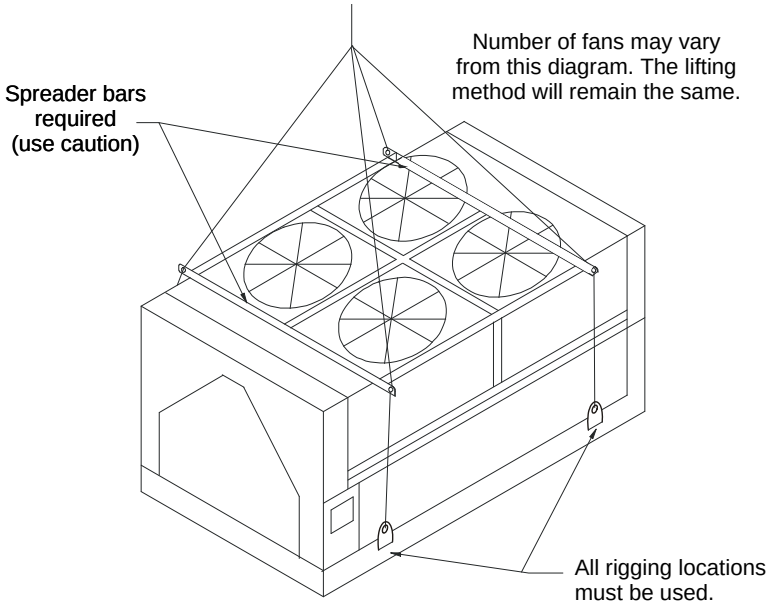



***Figure 2, Required Lifting Arrangement***

NOTE: All lifting locations must be used to prevent damage to unit.



# Location

## Unit Placement

AGZ units are for outdoor applications and can be mounted either on a roof or at ground level. For roof mounted applications, install the unit on a steel channel or I-beam frame to support the unit above the roof. For ground level applications, install the unit on a substantial base that will not settle. A one-piece concrete slab with footings extended below the frost line is recommended. Be sure the foundation is level within 1/2" (13mm) over its length and width. It is recommended that the unit be raised a few inches with suitable supports, located at least under the mounting locations, to allow water to drain from under the unit and to facilitate cleaning under it. The foundation must be strong enough to support the weights listed in the Physical Data Tables beginning on page 37.

***Figure 3, Clearances***

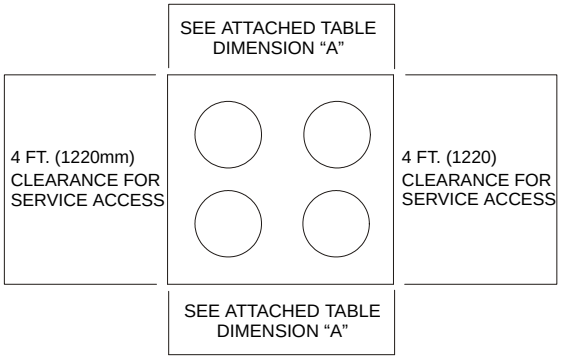

SEE ATTACHED TABLE DIMENSION "A"
4 FT. (1220mm) CLEARANCE FOR SERVICE ACCESS
4 FT. (1220) CLEARANCE FOR SERVICE ACCESS
SEE ATTACHED TABLE DIMENSION "A"

***Table 1, Recommended Minimum Clearances***

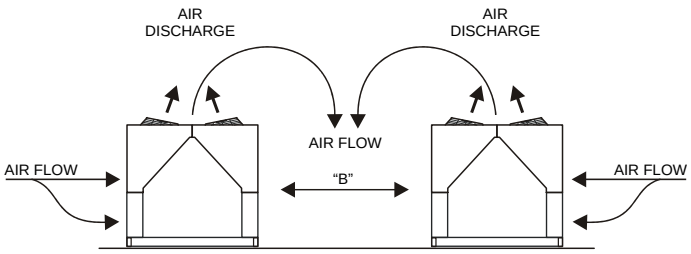
| Model Size | Coil Side "A" ft (m) | "B" ft (m) | "C" ft (m) | End Opposite Controls ft (m) | Control Panel End ft. (m) |
|---|---|---|---|---|---|
| **030C – 070C** | 4 (1.2) | 8 (2.4) | 6 (1.8) | 4 (1.2) | 4 (1.2) |
| **075C – 190C** | 6 (1.8) | 12 (3.6) | 8 (2.4) | 4 (1.2) | 4 (1.2) |

## Clearances

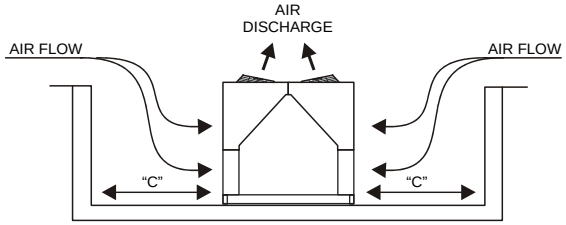
Do not block the flow of air to and from the condenser coil. Restricting airflow or allowing air recirculation will result in a decrease in unit performance and efficiency because discharge pressures are increased. There must be no obstruction above the unit that would deflect discharge air downward where it could be re-circulated back to the inlet of the condenser coil. The condenser fans are propeller type and will not operate with ductwork.

Install the unit with enough side clearance for air to enter the coil and for servicing. Provide service access to the evaporator, compressors, electrical control panel and piping components.

Do not allow debris to accumulate near the unit where it could be drawn into the condenser coil. Keep condenser coils and fan discharge free of snow or other obstructions to permit adequate airflow for proper operation.




The recommended minimum side clearance between two units is dimension "B' in table on this page.




The unit must not be installed in a pit or enclosure that is deeper or taller than the height of the unit unless extra space is provided. The minimum clearance on each side of the unit is dimension "C" in table on this page.

## Restricted Air Flow

### General

The clearances required for design-life operation of AGZ air-cooled condensers are described in the previous section. Occasionally, these clearances cannot be maintained due to site restrictions such as units being too close together or a fence or wall restricting airflow, or both.

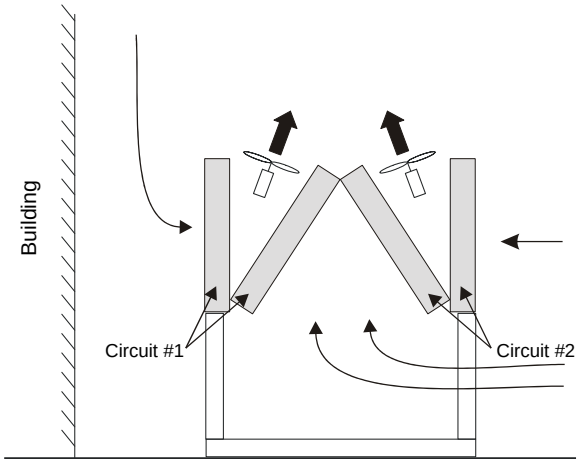
Fortunately, the McQuay AGZ chillers have several features that can mitigate the problems attributable to restricted airflow.

- The condenser section is shaped as shown Figure 4. This allows inlet air for these coils to come in from either side. A vertical coil and its adjacent angled coil are manifolded together to serve one refrigerant circuit.

- The MicroTech II® control is proactive in response to “off-design conditions”. In the case of single or compounded influences restricting airflow to the unit, the microprocessor will act to keep the compressor(s) running (possibly at reduced capacity) rather than allowing a shut-off on high discharge pressure.

- The MicroTech II® control can be programmed to sequence the compressors in the most advantageous way. For example, in Figure 4, it might be desirable to program circuit #1 to be the lag circuit (last circuit to reach full load) during periods of high ambient temperatures.

***Figure 4, Coil and Fan Arrangement***




The following sections discuss the most common situations of condenser air restriction and give capacity and power adjustment factors for each. Note that in unusually severe conditions, the MicroTech II® controller would adjust the unit operation to remain online until a less severe condition is reached.

## Case 1, Building or Wall on One Side of One Unit

The existence of a screening wall or the wall of a building in close proximity to an air-cooled chiller is common in both rooftop and ground level applications. Hot air recirculation on the coils adjoining the wall will increase compressor discharge pressure, decreasing capacity and increasing power consumption. Only the compressor(s) connected to these coils will be affected. Circuits opposite the wall are unaffected.

When close to a wall, it is desirable to place chillers on the North or East side of the walls. It is also desirable to have prevailing winds blowing parallel to the unit's long axis. The worst case is to have wind blowing hot discharge air into the wall.

***Figure 5, Unit Adjacent to Wall***

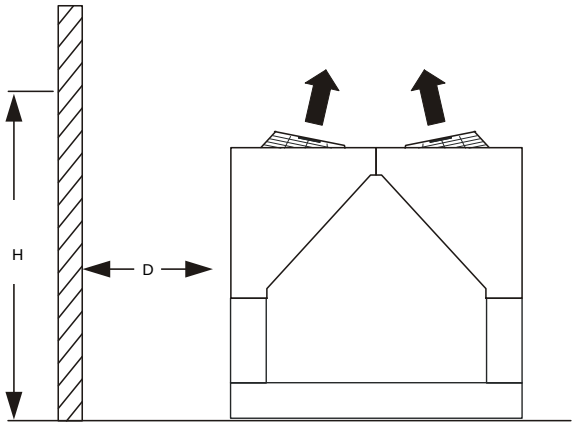
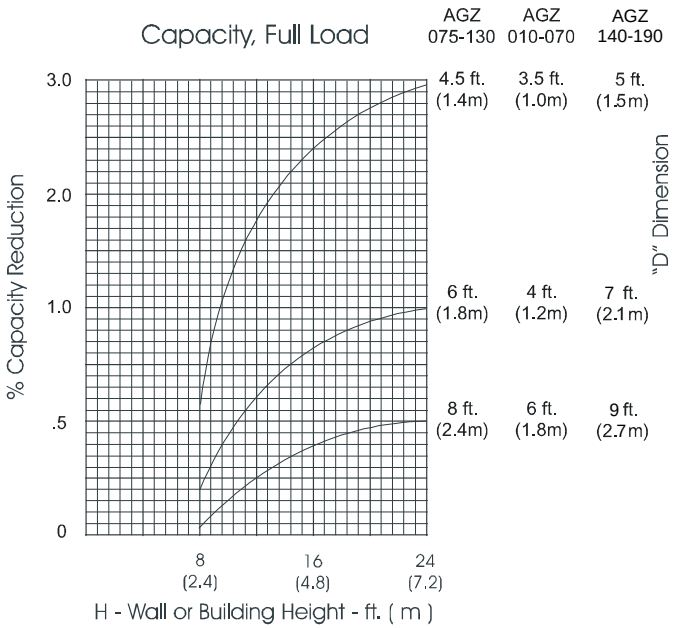
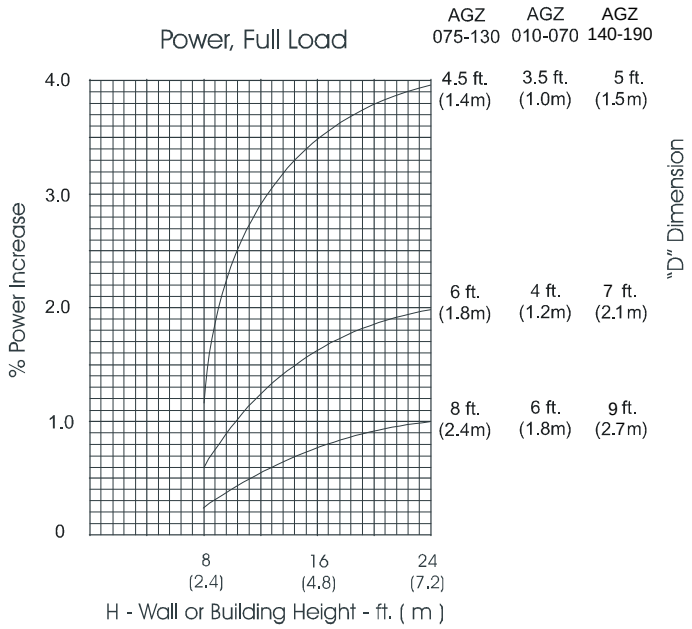



***Figure 6, Adjustment Factors***



## Case 2, Two Units Side By Side

Two or more units sited side by side are common. If spaced closer than 12 feet (3.7 meters) or 8 feet (2.5 meters) depending on size, it is necessary to adjust the performance of each unit; circuits adjoining each other are affected. **NOTE:** This case applies only to *two* units side by side. See Case 3 for three or more parallel units. If one of the two units also has a wall adjoining it, see Case 1. Add the two adjustment factors together and apply to the unit located between the wall and the other unit.

Mounting units end to end will not necessitate adjusting performance. Depending on the actual arrangement, sufficient space must be left between the units for access to the control panel door opening and/or evaporator tube removal. See “Clearance” section of this guide for requirements for specific units.

***Figure 7, Two Units Side by Side***

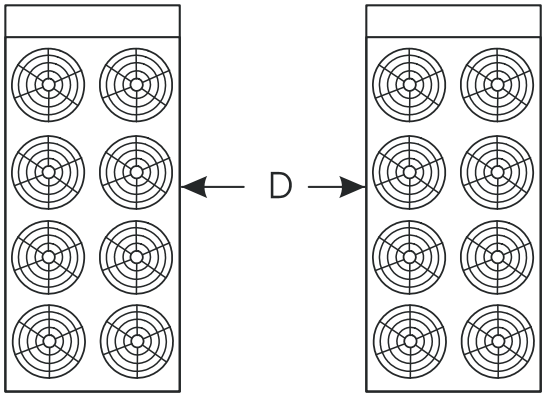
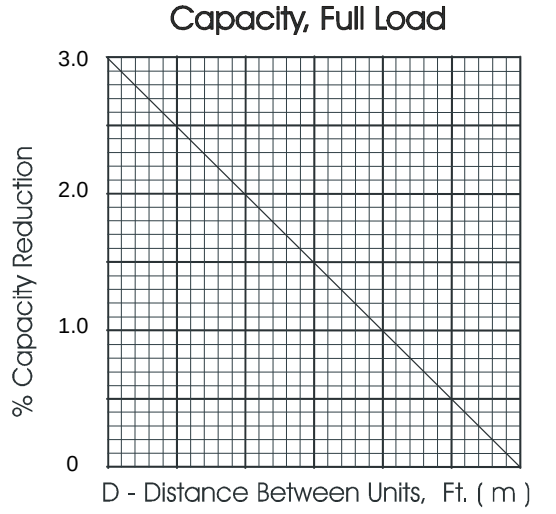
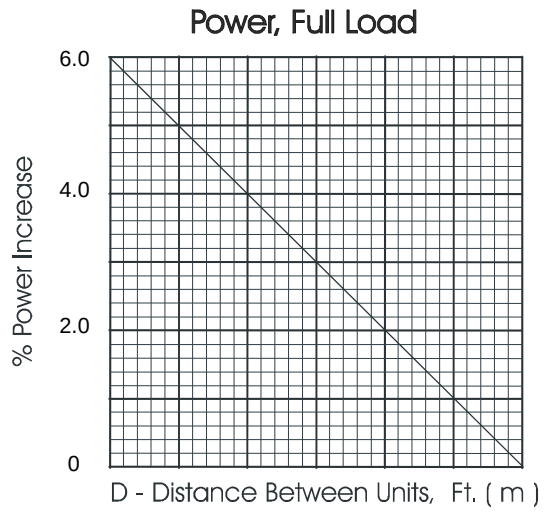



***Figure 8, Adjustment Factor***




| | | | | |
|---|---|---|---|---|
| AGZ 010-070 | 6.5 (2.0) | 7 (2.1) | 7.5 (2.2) | 8 (2.4) |
| AGZ 075-130 | 9 (2.7) | 10 (3.0) | 11 (3.3) | 12 (3.6) |
| AGZ 140-190 | 11 (3.4) | 12 (3.7) | 13 (4.0) | 14 (4.3) |




| | | | | |
|---|---|---|---|---|
| AGZ 010-070 | 6.5 (2.0) | 7 (2.1) | 7.5 (2.2) | 8 (2.4) |
| AGZ 075-130 | 9 (2.7) | 10 (3.0) | 11 (3.3) | 12 (3.6) |
| AGZ 140-190 | 11 (3.4) | 12 (3.7) | 13 (4.0) | 14 (4.3) |

## Case 3, Three or More Units Side By Side

When three or more units are side by side, the outside chillers (1 and 3 in this case) are influenced by the middle unit only on their inside circuits. Their adjustment factors will be the same as Case 2. All inside units (only number 2 in this case) are influenced on both sides and must be adjusted by the factors shown below.

***Figure 9, Three or More Units***

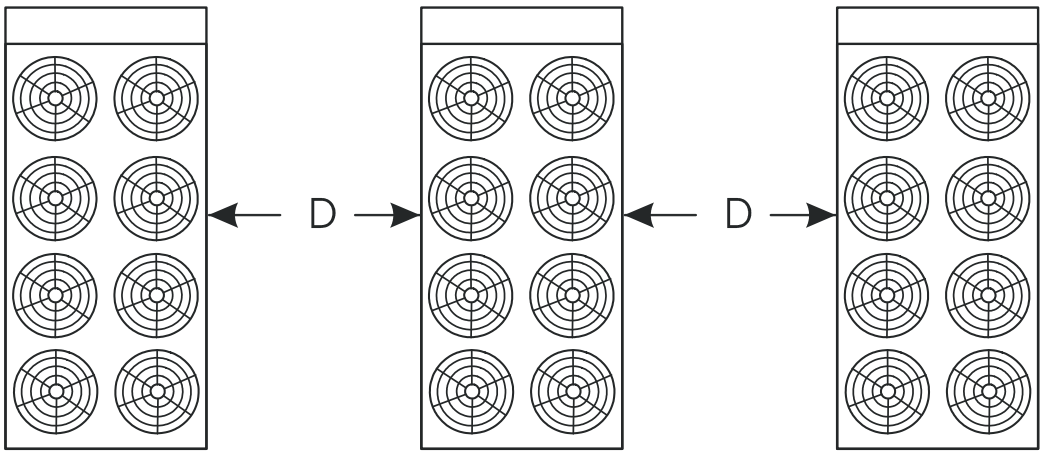
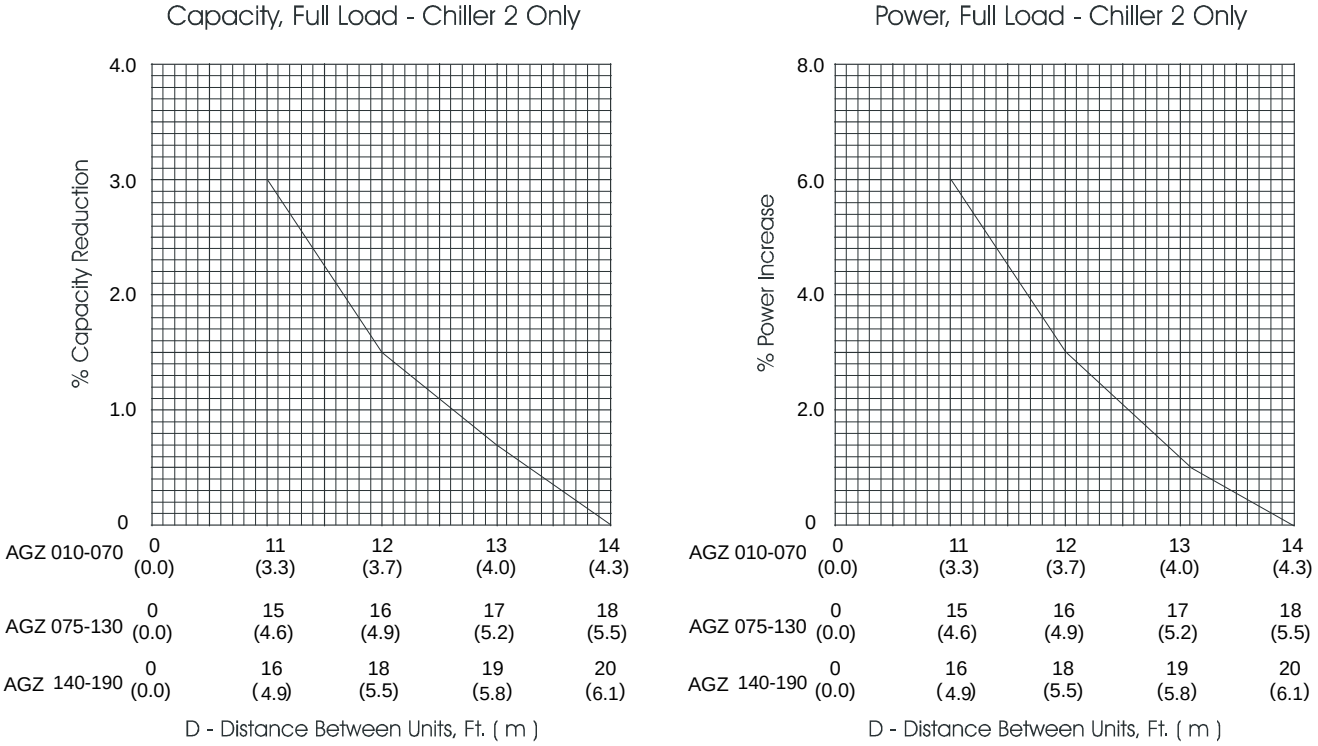



***Figure 10, Adjustment Factor***



## Case 4, Open Screening Walls

Decorative screening walls are often used to help conceal a unit either on grade or on a rooftop. These walls should be designed such that the combination of their open area and distance from the unit do not require performance adjustment. It is assumed that the wall height is equal to or less than the unit height when mounted on its base support. This is usually satisfactory for concealment. If the wall height is greater than the unit height, see Case 5, Pit Installation.

The distance from the ends of the unit to the end walls should be sufficient for service, opening control panel doors, and pulling evaporator tubes, as applicable.

If each side wall is a different distance from the unit, the distances can be averaged providing either wall is not less than 8 feet (2.4 meters) from the unit. For example, do not average *4 feet* and 20 feet to equal 12 feet.

***Figure 11, Open Screening Walls***

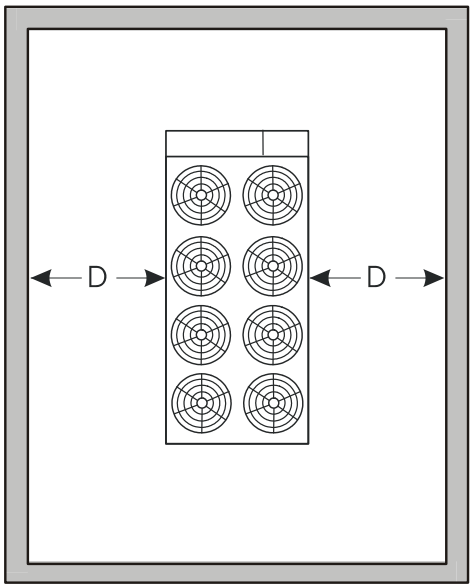
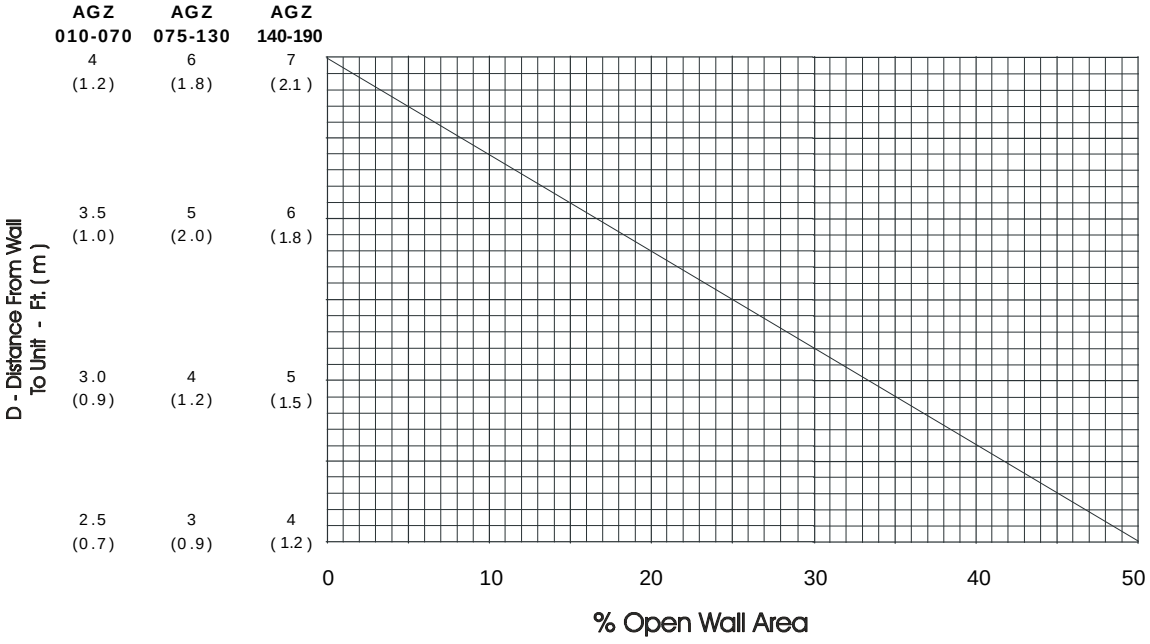



***Figure 12, Wall Free Area vs Distance***



## Case 5, Pit/Solid Wall Installation

Pit installations can cause operating problems. Great care should be exercised if they are to be used on an installation. Recirculation and restriction can both occur. A solid wall surrounding a unit is substantially the same as a pit and the data presented here should be used.

Steel grating is sometimes used to cover a pit to prevent accidental falls or trips into the pit. The grating material and installation design must be strong enough to prevent such accidents, yet provide abundant open area or serious recirculation problems will occur. Have any pit installation reviewed by McQuay application engineers prior to installation to make sure it has sufficient air-flow characteristics. The installation design engineer must approve the work to avoid an unreasonable risk of accident.

***Figure 13, Pit Installation***

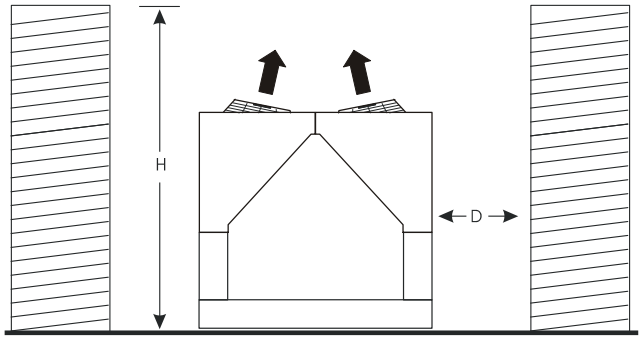
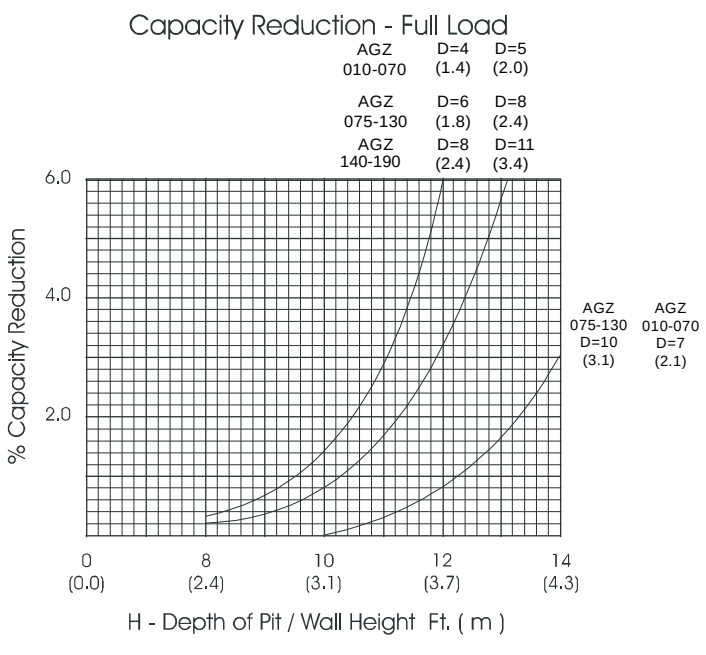
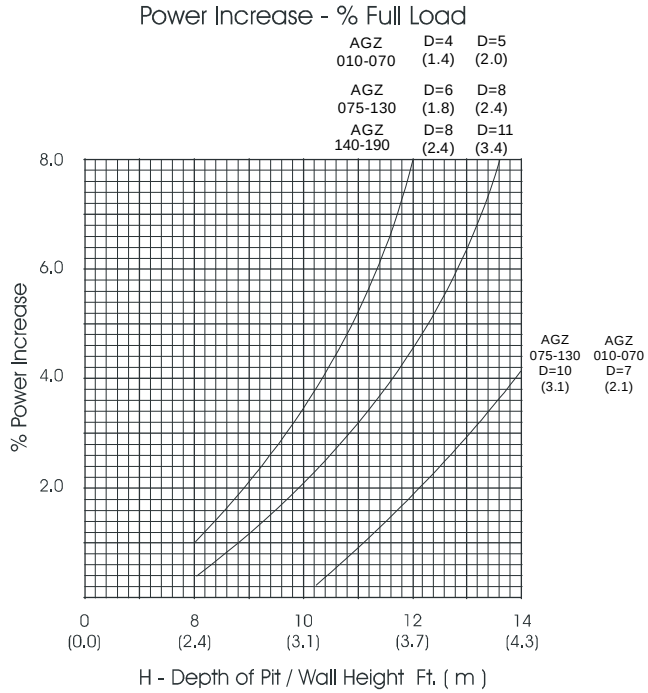



***Figure 14, Adjustment Factor***



### Sound Isolation

The low sound level of the AGZ chiller is suitable for most applications. When additional sound reduction is necessary, locate the unit away from sound sensitive areas. Avoid locations beneath windows or between structures where normal operating sounds may be objectionable. Reduce structurally transmitted sound by isolating water lines, electrical conduit and the unit itself. Use wall sleeves and rubber isolated piping hangers to reduce transmission of water or pump noise into occupied spaces. Use flexible electrical conduit to isolate sound transmission through electrical conduit. Spring isolators are effective in reducing the low amplitude sound generated by scroll compressors and for unit isolation in sound sensitive areas.

## Vibration Isolators

Vibration isolators are recommended for all roof-mounted installations or wherever vibration transmission is a consideration. Page 13 lists isolator loads for all unit sizes. Isolators are also recommended for slab installations, primarily to keep the unit base from resting its entire length directly on the slab.

### Isolator Installation

The unit should be initially installed on shims or blocks at the listed free height. When all piping, wiring, flushing, charging, etc. is completed, adjust the springs upward to load them and to provide clearance to remove the shims or blocks.

Installation of spring isolators requires flexible piping connections and at least three feet of conduit flex tie-ins. Piping and conduit must be supported independently of the unit.

## Table 2, AGZ-CH, Packaged Unit, Isolator Loads at Each Mounting Location (With Al Fins)

| UNIT SIZE | FAN QTY | | SHIPPING WEIGHT | OPERATING WEIGHT | LOCATION M1 FRONT-RIGHT | LOCATION M2 FRONT-LEFT | LOCATION M3 REAR-RIGHT | LOCATION M4 REAR-LEFT | LOCATION M5 NA | LOCATION M6 NA | COPPER FINS ADD NOTE 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGZ030C** | 4 | lbs | 3180 | 3195 | 1042 | 785 | 780 | 588 | - | - | 79 |
| | | kg | 1442 | 1449 | 473 | 356 | 354 | 267 | - | - | 36 |
| **AGZ035C** | 4 | lbs | 3185 | 3205 | 1045 | 790 | 780 | 590 | - | - | 79 |
| | | kg | 1445 | 1454 | 474 | 358 | 354 | 268 | - | - | 36 |
| **AGZ040C** | 4 | lbs | 3265 | 3285 | 1060 | 811 | 800 | 614 | - | - | 88 |
| | | kg | 1481 | 1490 | 481 | 368 | 363 | 279 | - | - | 40 |
| **AGZ045C** | 4 | lbs | 3420 | 3445 | 1093 | 854 | 841 | 657 | - | - | 133 |
| | | kg | 1551 | 1563 | 496 | 387 | 381 | 298 | - | - | 60 |
| **AGZ050C** | 4 | lbs | 3495 | 3525 | 1120 | 880 | 854 | 671 | - | - | 133 |
| | | kg | 1585 | 1599 | 508 | 399 | 387 | 304 | - | - | 60 |
| **AGZ055C** | 4 | lbs | 3525 | 3555 | 1125 | 891 | 860 | 679 | - | - | 133 |
| | | kg | 1599 | 1613 | 510 | 404 | 390 | 308 | - | - | 60 |
| **AGZ060C** | 4 | lbs | 3710 | 3760 | 1190 | 951 | 899 | 720 | - | - | 133 |
| | | kg | 1683 | 1706 | 540 | 431 | 408 | 327 | - | - | 60 |
| **AGZ065C** | 4 | lbs | 3740 | 3795 | 1198 | 966 | 903 | 728 | - | - | 158 |
| | | kg | 1696 | 1721 | 543 | 438 | 410 | 330 | - | - | 72 |
| **AGZ070C** | 4 | lbs | 4150 | 4205 | 1333 | 954 | 1118 | 800 | - | - | 158 |
| | | kg | 1882 | 1907 | 605 | 433 | 507 | 363 | - | - | 72 |
| **AGZ075C** | 6 | lbs | 5460 | 5510 | 1710 | 1680 | 1070 | 1050 | - | - | 200 |
| | | kg | 2477 | 2499 | 776 | 762 | 485 | 476 | - | - | 91 |
| **AGZ080C** | 6 | lbs | 5545 | 5600 | 1770 | 1770 | 1030 | 1030 | - | - | 200 |
| | | kg | 2515 | 2540 | 803 | 803 | 467 | 467 | - | - | 91 |
| **AGZ090C** | 6 | lbs | 5645 | 5710 | 1777 | 1742 | 1105 | 1086 | - | - | 238 |
| | | kg | 2561 | 2590 | 806 | 790 | 501 | 493 | - | - | 108 |
| **AGZ100C** | 6 | lbs | 5750 | 5815 | 1814 | 1778 | 1123 | 1100 | - | - | 238 |
| | | kg | 2608 | 2638 | 823 | 807 | 509 | 499 | - | - | 108 |

**NOTE**

1. Additional weight for copper coils is per mounting location.
2. Locations are looking at the unit's control panel; see Figure 15

## *Table 3, AGZ-CH, Packaged Unit, Isolator Loads at Each Mounting Location (With Al Fins)*

| UNIT SIZE | FAN QTY | UOM | SHIP. WGT | OPN. WGT | LOC. M1 FRONT-RIGHT | LOC. M2 FRONT-LEFT | LOC. M3 MID-RIGHT | LOC. M4 MID-LEFT | LOC. M5 REAR-RIGHT | LOC. M6 REAR-LEFT | LOC. M7 END RIGHT | LOC. M8 END LEFT | COPPER FINS ADD NOTE 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AGZ110C** | 8 | lbs | 7200 | 7270 | 1512 | 1512 | 1211 | 1212 | 911 | 912 | - | - | 178 |
| | | kg | 3266 | 3298 | 686 | 686 | 549 | 550 | 413 | 414 | - | - | 81 |
| **AGZ125C** | 8 | lbs | 7420 | 7500 | 1583 | 1540 | 1267 | 1233 | 951 | 926 | - | - | 195 |
| | | kg | 3366 | 3402 | 718 | 699 | 575 | 559 | 431 | 420 | - | - | 89 |
| **AGZ130C** | 8 | lbs | 7570 | 7665 | 1617 | 1574 | 1294 | 1260 | 971 | 849 | - | - | 212 |
| | | kg | 3434 | 3477 | 733 | 714 | 587 | 572 | 440 | 385 | - | - | 96 |
| **AGZ140C** | 10 | lbs | 9155 | 9530 | 1732 | 1686 | 1626 | 1581 | 1473 | 1432 | - | - | 266 |
| | | kg | 4153 | 4323 | 786 | 765 | 738 | 717 | 668 | 650 | - | - | 121 |
| **AGZ160C** | 10 | lbs | 9320 | 9680 | 1794 | 1713 | 1669 | 1593 | 1491 | 1420 | - | - | 266 |
| | | kg | 4228 | 4391 | 814 | 777 | 757 | 723 | 676 | 644 | - | - | 121 |
| **AGZ180C** | 10 | lbs | 9470 | 9830 | 1817 | 1767 | 1681 | 1634 | 1487 | 1444 | - | - | 266 |
| | | kg | 4296 | 4459 | 824 | 802 | 763 | 741 | 675 | 655 | - | - | 121 |
| **AGZ190C** | 12 | lbs | 10585 | 11070 | 1884 | 1855 | 1581 | 1556 | 1258 | 1239 | 855 | 842 | 855 |
| | | kg | 4801 | 5021 | 855 | 841 | 717 | 706 | 571 | 562 | 388 | 382 | 388 |

**NOTE**

1. Additional weight for copper coils is per mounting location.
2. Locations are looking at the unit's control panel; see Figure 15

### *Table 4, AGZ-CB, Remote Evaporator, Isolator Loads at Each Mounting Location (With Al. Fins)*

| UNIT SIZE | FAN QTY | UOM | SHIPPING WEIGHT | OPERATING WEIGHT | LOCATION | | | | | | COPPER FINS ADD (1) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | M1 FRONT-RT | M2 FRONT-LEFT | M3 REAR-RT | M4 REAR-LEFT | M5 - | M6 - | |
| AGZ030C | 4 | lbs | 3070 | 3130 | 1032 | 753 | 778 | 567 | - | - | 79 |
| | | kg | 1393 | 1420 | 468 | 342 | 353 | 257 | - | - | 36 |
| AGZ035C | 4 | lbs | 3070 | 3130 | 1032 | 753 | 778 | 567 | - | - | 79 |
| | | kg | 1393 | 1420 | 468 | 342 | 353 | 257 | - | - | 36 |
| AGZ040C | 4 | lbs | 3115 | 3195 | 1043 | 765 | 800 | 587 | - | - | 88.5 |
| | | kg | 1413 | 1449 | 473 | 347 | 363 | 266 | - | - | 40 |
| AGZ045C | 4 | lbs | 3260 | 3360 | 1082 | 806 | 844 | 628 | - | - | 133 |
| | | kg | 1479 | 1524 | 491 | 366 | 383 | 285 | - | - | 60 |
| AGZ050C | 4 | lbs | 3280 | 3380 | 1090 | 811 | 848 | 631 | - | - | 133 |
| | | kg | 1488 | 1533 | 494 | 368 | 385 | 286 | - | - | 60 |
| AGZ055C | 4 | lbs | 3300 | 3410 | 1079 | 754 | 928 | 649 | - | - | 133 |
| | | kg | 1497 | 1547 | 489 | 342 | 421 | 294 | - | - | 60 |
| AGZ060C | 4 | lbs | 3320 | 3430 | 1125 | 743 | 941 | 621 | - | - | 133 |
| | | kg | 1506 | 1556 | 510 | 337 | 427 | 282 | - | - | 60 |
| AGZ065C | 4 | lbs | 3350 | 3470 | 1136 | 751 | 953 | 630 | - | - | 158 |
| | | kg | 1520 | 1574 | 515 | 341 | 432 | 286 | - | - | 72 |
| AGZ070C | 4 | lbs | 3580 | 3700 | 1194 | 788 | 1035 | 683 | - | - | 158 |
| | | kg | 1624 | 1678 | 542 | 357 | 469 | 310 | - | - | 72 |
| AGZ075C | 6 | lbs | 5065 | 5225 | 1625 | 1618 | 993 | 989 | - | - | 200 |
| | | kg | 2297 | 2370 | 737 | 734 | 450 | 449 | - | - | 91 |
| AGZ080C | 6 | lbs | 5160 | 5320 | 1701 | 1710 | 952 | 957 | - | - | 200 |
| | | kg | 2341 | 2413 | 772 | 776 | 432 | 434 | - | - | 91 |
| AGZ090C | 6 | lbs | 5220 | 5390 | 1722 | 1715 | 979 | 974 | - | - | 238 |
| | | kg | 2368 | 2445 | 781 | 778 | 444 | 442 | - | - | 108 |
| AGZ100C | 6 | lbs | 5300 | 5480 | 1751 | 1744 | 995 | 990 | - | - | 238 |
| | | kg | 2404 | 2486 | 794 | 791 | 451 | 449 | - | - | 108 |

**Note:**

**1.** Additional weight for Copper Finned Coils is per unit mounting location.

**2.** Locations are looking at the unit's control panel; see Figure 15.

### *Table 5, AGZ-CB, Remote Evaporator, Isolator Loads at Each Mounting Location (With Al. Fins)*

| UNIT SIZE | FAN QTY | UOM | SHIP. WGT | OPN. WGT | LOC. M1 | LOC. M2 | LOC. M3 | LOC. M4 | LOC. M5 | LOC. M6 | LOC. M7 | LOC. M8 | COPPER FINS ADD NOTE 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FRONT-RIGHT | FRONT-LEFT | MID-RIGHT | MID-LEFT | REAR-RIGHT | REAR-LEFT | END RIGHT | END LEFT | |
| AGZ110C | 8 | lbs | 5830 | 6035 | 1255 | 1256 | 1005 | 1006 | 756 | 757 | - | - | 178 |
| | | kg | 2644 | 2737 | 569 | 570 | 456 | 456 | 343 | 343 | - | - | 81 |
| AGZ125C | 8 | lbs | 5995 | 6215 | 1324 | 1287 | 1051 | 1021 | 777 | 755 | - | - | 195 |
| | | kg | 2719 | 2819 | 601 | 584 | 477 | 463 | 352 | 342 | - | - | 89 |
| AGZ130C | 8 | lbs | 6085 | 6315 | 1331 | 1332 | 1052 | 1052 | 774 | 774 | - | - | 212 |
| | | kg | 2760 | 2864 | 604 | 604 | 477 | 477 | 351 | 351 | - | - | 96 |
| AGZ140C | 10 | lbs | 8120 | 8380 | 1690 | 1638 | 1452 | 1407 | 1114 | 1079 | - | - | 266 |
| | | kg | 3683 | 3801 | 767 | 743 | 659 | 638 | 505 | 489 | - | - | 121 |
| AGZ160C | 10 | lbs | 8240 | 8510 | 1748 | 1659 | 1492 | 1415 | 1127 | 1069 | - | - | 266 |
| | | kg | 3738 | 3860 | 793 | 753 | 677 | 642 | 511 | 485 | - | - | 121 |
| AGZ180C | 10 | lbs | 8350 | 8630 | 1764 | 1707 | 1499 | 1451 | 1123 | 1086 | - | - | 266 |
| | | kg | 3788 | 3915 | 800 | 774 | 680 | 658 | 509 | 493 | - | - | 121 |
| AGZ190C | 12 | lbs | 9685 | 9965 | 1795 | 1740 | 1470 | 1420 | 1120 | 1085 | 645 | 625 | 675 |
| | | kg | 4393 | 4520 | 814 | 789 | 667 | 644 | 508 | 492 | 293 | 284 | 306 |

**Note:**

1. Additional weight for Copper Finned Coils is per unit mounting location.
2. Locations are looking at the unit's control panel; see Figure 15.

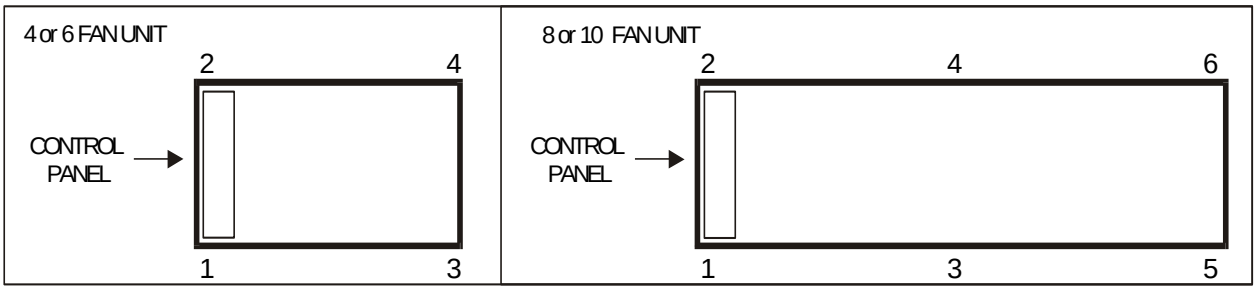
### *Table 6, Spring Isolator Kit Numbers*

| TGZ-A SIZE | PACKAGED UNIT | | REMOTE EVAPORATOR | |
|---|---|---|---|---|
| | ALUMINUM FINS | COPPER FINS | ALUMINUM FINS | COPPER FINS |
| **030** | 332320101 | 332320101 | 332320101 | 332320101 |
| **035** | 332320101 | 332320101 | 332320101 | 332320101 |
| **040** | 332320101 | 332320101 | 332320101 | 332320101 |
| **045** | 332320101 | 332320109 | 332320101 | 332320114 |
| **050** | 332320101 | 332320109 | 332320101 | 332320114 |
| **055** | 332320101 | 332320109 | 332320104 | 332320103 |
| **060** | 332320102 | 332320103 | 332320104 | 332320103 |
| **065** | 332320102 | 332320110 | 332320104 | 332320104 |
| **070** | 332320103 | 332320110 | 332320104 | 332320104 |
| **075** | 332320104 | 332320105 | 332320104 | 332320105 |
| **080** | 332320105 | 332320105 | 332320104 | 332320105 |
| **090** | 332320105 | 332320105 | 332320105 | 332320105 |
| **100** | 332320105 | 332320105 | 332320105 | 332320105 |
| **110** | 332320106 | 332320111 | 332320106 | 332320106 |
| **125** | 332320106 | 332320111 | 332320106 | 332320106 |
| **130** | 332320106 | 332320111 | 332320106 | 332320106 |
| **140** | 332320107 | 332320112 | 332320107 | 332320107 |
| **160** | 332320107 | 332320112 | 332320107 | 332320107 |
| **180** | 332320107 | 332320112 | 332320107 | 332320107 |
| **190** | 332320108 | 332320113 | 332320108 | 332320115 |

### *Table 7, R-I-S Isolator Kit Numbers*

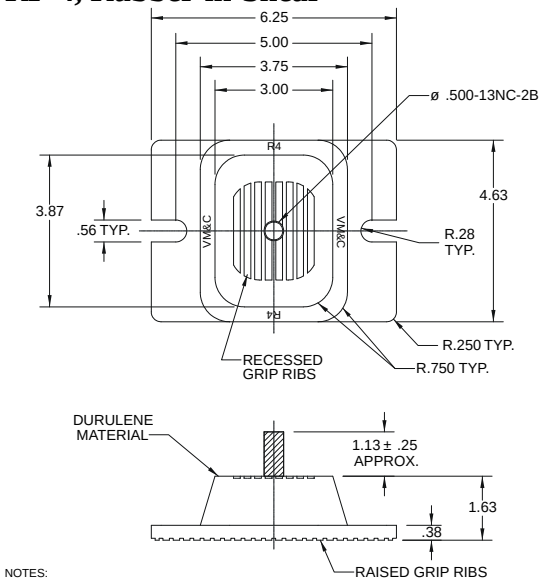
| TGZ-A SIZE | PACKAGED UNIT | | REMOTE EVAPORATOR | |
|---|---|---|---|---|
| | ALUMINUM FINS | COPPER FINS | ALUMINUM FINS | COPPER FINS |
| **030** | 332325101 | 332325101 | 332325101 | 332325101 |
| **035** | 332325101 | 332325101 | 332325101 | 332325101 |
| **040** | 332325101 | 332325101 | 332325101 | 332325101 |
| **045** | 332325101 | 332325101 | 332325101 | 332325101 |
| **050** | 332325101 | 332325101 | 332325101 | 332325101 |
| **055** | 332325101 | 332325101 | 332325101 | 332325101 |
| **060** | 332325101 | 332325101 | 332325101 | 332325101 |
| **065** | 332325101 | 332325101 | 332325101 | 332325101 |
| **070** | 332325101 | 332325102 | 332325101 | 332325102 |
| **075** | 332325102 | 332325102 | 332325102 | 332325102 |
| **080** | 332325102 | 332325102 | 332325102 | 332325102 |
| **090** | 332325102 | 332325102 | 332325102 | 332325102 |
| **100** | 332325102 | 332325102 | 332325102 | 332325102 |
| **110** | 332325103 | 332325103 | 332325103 | 332325103 |
| **125** | 332325103 | 332325103 | 332325103 | 332325103 |
| **130** | 332325103 | 332325103 | 332325103 | 332325103 |
| **140** | 332325104 | 332325104 | 332325104 | 332325104 |
| **160** | 332325104 | 332325104 | 332325104 | 332325104 |
| **180** | 332325104 | 332325104 | 332325104 | 332325104 |
| **190** | 332325105 | 332325106 | 332325105 | 332325106 |

***Figure 15, Mounting Locations***



**NOTE:**
AGZ 030 – 070 = 4-fan
AGZ 075 – 100 = 6-fan
AGZ 110 – 130 = 8-fan
AGZ 140 – 180 = 10-fan
AGZ 190 = 12-fan

## RP-4, Rubber-in-Shear

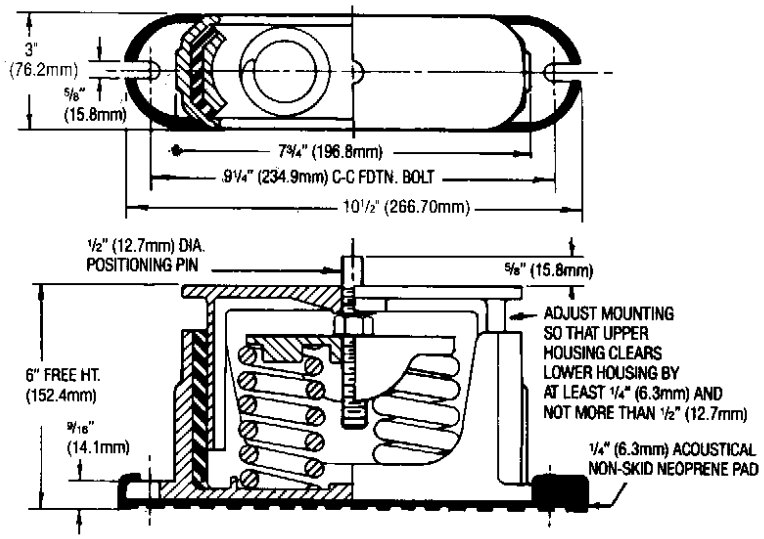



NOTES:

1. MOUNT MATERIAL TO BE DURULENE RUBBER.
2. MOLDED STEEL AND ELASTOMER MOUNT FOR OUTDOOR SERVICE CONDITIONS.
3. RP-4 MOUNT VERSION WITH STUD IN PLACE.

DRAWING NUMBER 3314814
ALL DIMENSIONS ARE IN DECIMAL INCHES

## CP-2, Spring Isolator


3" (76.2mm)
5/8" (15.8mm)
7¾" (196.8mm)
9¼" (234.9mm) C-C FDTN. BOLT
10½" (266.70mm)
½" (12.7mm) DIA. POSITIONING PIN
5/8" (15.8mm)
ADJUST MOUNTING SO THAT UPPER HOUSING CLEARS LOWER HOUSING BY AT LEAST ¼" (6.3mm) AND NOT MORE THAN ½" (12.7mm)
6" FREE HT. (152.4mm)
9/16" (14.1mm)
¼" (6.3mm) ACOUSTICAL NON-SKID NEOPRENE PAD

### *Table 8, Isolator Locations, AGZ CH, Packaged with Aluminum Fins*

| UNIT SIZE | RUBBER-IN-SHEAR MOUNTS | | | | | | SPRING-FLEX MOUNTINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 | M6 | M1 | M2 | M3 | M4 | M5 | M6 |
| 030 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 035 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 040 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 045 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 050 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 055 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 060 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Black | CP-2 Black | | |
| 065 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Black | CP-2 Black | | |
| 070 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl e | | |
| 075 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl le | | |
| 080 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 090 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 100 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 110 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 120 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 130 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 140 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |
| 160 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |
| 180 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |

| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Gray | CP-2 Gray | CP-2 Dark Green | CP-2 Dark Green | CP-2 Dark Green | CP-2 Dark Green | CP-2 Black | CP-2 Black |

**NOTE:** See Figure 15 for mounting locations.

### *Table 9, Isolator Locations, AGZ CH, Packaged with Copper Fins*

| UNIT SIZE | RUBBER-IN-SHEAR MOUNTS | | | | | | SPRING-FLEX MOUNTINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 | M6 | M1 | M2 | M3 | M4 | M5 | M6 |
| 030 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 035 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 040 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 045 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Black | | |
| 050 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Black | | |
| 055 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Black | | |
| 060 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Purple | | |
| 065 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 070 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 075 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 080 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 090 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 100 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 110 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn |
| 120 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn n | CP-2 Dark Grn | CP-2 Dark Grn |
| 130 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn |
| 140 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray |
| 160 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray |
| 180 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray |

| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | RP-4 Lime | RP-4 Lime | RP-4 Lime | RP-4 Lime | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 White | CP-2 White | CP-2 White | CP-2 White | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray |

**NOTE:** See Figure 15 for mounting locations.

### *Table 10, Isolator Locations, AGZ CB, Remote Evaporator with Aluminum Fins*

| UNIT SIZE | RUBBER-IN-SHEAR MOUNTS | | | | | | SPRING-FLEX MOUNTINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 | M6 | M1 | M2 | M3 | M4 | M5 | M6 |
| 030 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 035 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 040 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 045 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 050 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 055 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Grn | CP-2 Dark Prpl | | |
| 060 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Grn | CP-2 Dark Prpl | | |
| 065 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Grn | CP-2 Dark Prpl | | |
| 070 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Grn | CP-2 Dark Prpl | | |
| 075 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl | | |
| 080 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl | | |
| 090 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 100 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 110 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 120 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 130 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 140 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |
| 160 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |
| 180 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |

| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Black | CP-2 Black |

**NOTE:** See Figure 15 for mounting locations.

### *Table 11, Isolator Locations, AGZ CB, Remote Evaporator with Copper Fins*

| UNIT SIZE | RUBBER-IN-SHEAR MOUNTS | | | | | | SPRING-FLEX MOUNTINGS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M1 | M2 | M3 | M4 | M5 | M6 | M1 | M2 | M3 | M4 | M5 | M6 |
| 030 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 035 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 040 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Black | CP-2 Black | CP-2 Black | | |
| 045 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl | CP-2 Dark Prpl | | |
| 050 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl | CP-2 Dark Prpl | | |
| 055 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | | |
| 060 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | | |
| 065 | RP-4 Brown | RP-4 Brown | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Grn | CP-2 Dark Prpl | | |
| 070 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl | CP-2 Dark Prpl | | |
| 075 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 080 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 090 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 100 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | | | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn | | |
| 110 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 120 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 130 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brown | RP-4 Brown | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Grn | CP-2 Dark Prpl | CP-2 Dark Prpl |
| 140 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |
| 160 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |
| 180 | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |

| | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 190 | RP-4 Lime | RP-4 Lime | RP-4 Lime | RP-4 Lime | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | RP-4 Brick Red | CP-2 White | CP-2 White | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Gray | CP-2 Dark Grn | CP-2 Dark Grn |

**NOTE:** See Figure 15 for mounting locations.

## Water Flow Limitations, Constant Flow

The evaporator flow rates and pressure drops shown on page 28 are for full-load design purposes and apply equally to packaged or remote evaporator applications. The maximum flow rate and pressure drop are based on a 6-degree temperature drop. Avoid higher flow rates with resulting lower temperature drops to prevent potential control problems resulting from very small control bands and limited start up/shut off temperature changes.

The minimum flow and pressure drop is based on a full load evaporator temperature drop of 16-degrees.

Evaporator flow rates below the minimum values can result in laminar flow causing freeze-up problems, scaling and poor control. Flow rates above the maximum values will result in unacceptable pressure drops and can cause excessive erosion, potentially leading to failure.

## Variable Speed Pumping

Variable water flow involves changing the water flow through the evaporator as the load changes. McQuay chillers are designed for this duty provided that the rate of change in water flow is slow and the minimum and maximum flow rates for the vessel are not exceeded.

The recommended maximum change in water flow is 10 percent of the change per minute.

When units are operated with flow rates less than nominal (see Table 16), the “Evap Delta T” setpoint must be changed proportionally to match the minimum operating flow rate. The “Delta T” setting should be increased by the same percentage as the flow reduction is from the nominal rating in order to prevent short cycling. This will require reevaluation of “Cool LWT”, “Startup Delta T”, and “Stop Delta T” settings as well.

## Drain Valves at Start-up

Model sizes AGZ 140 and larger have shell-and-tube evaporators. They are drained of water in the factory and shipped with evaporator drain plugs removed and stored in the control panel or with an open ball valve in the drain holes. The drain is located on the bottom of the vessel. Be sure to replace plugs or close the valves prior to filling the vessel with fluid.

## Water Piping

Local authorities can supply the installer with the proper building and safety codes required for safe and proper installation.

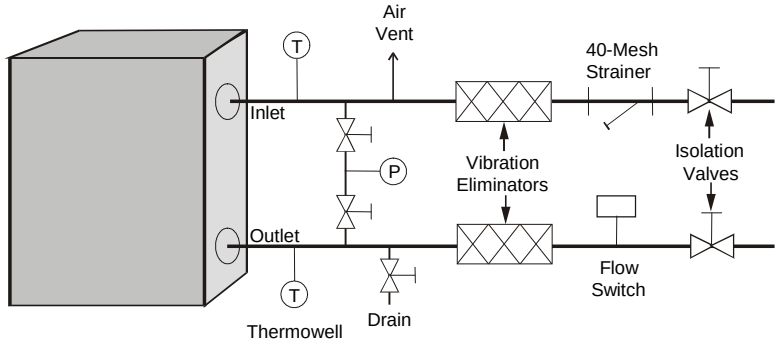
Install piping with minimum bends and changes in elevation to minimize pressure drop. The following issues must be considered when designing and installing water piping:

1. Vibration eliminators to reduce vibration and noise transmission to the building.
2. Shutoff valves are required to isolate the unit from the piping during unit servicing.
3. Manual or automatic air vent valves at the high points of the system. Drains must be installed at the lowest points in the system.
4. Adequate water pressure must be maintained (expansion tank or regulating valve).
5. Temperature and pressure indicators located at the unit are required to aid in unit servicing.
6. A strainer or other means of removing foreign matter from the water before it enters the pump must be installed. Place the strainer far enough upstream to prevent cavitation at the pump inlet (consult pump manufacturer for recommendations). The use of a strainer will prolong pump life and keep system performance up.
7. Flush the system water piping thoroughly before making connections to the unit evaporator. Install a 40-mesh strainer in the return water line, before the inlet to the chiller, on models AGZ 030 to 130 and a 20-mesh on models 140 to 190. Design the water piping so the chilled water circulating pump discharges into the evaporator inlet.
8. The unit's evaporator has a thermostat and heater to prevent freeze-up down to -20° F (-29° C). The heating cable can be wired to a separate 115 V supply circuit. As shipped from the factory, the heating cable is wired to the control circuit. All water piping to the unit must also be protected to prevent freezing.
9. If the unit is used as a replacement chiller, flush the system thoroughly before unit installation. Regular water analysis and chemical water treatment for the evaporator loop is recommended immediately at equipment start-up.
10. The total water volume in the system should be sufficient to prevent frequent "on-off" cycling. Turnover rate should not be less than 4 minutes for normal variable cooling loads.
11. When glycol is added to the water system for freeze protection, the refrigerant suction pressure will be lower, cooling performance less, and water side pressure drop greater. If the percentage of glycol is high, or if propylene is used instead of ethylene glycol, the added pressure drop and loss of performance could be substantial. When Glycol or Ice are selected as Unit Mode, the MicroTech II control will automatically reset the available range for the Leaving Water Temperature, Freezestat and Evaporator Pressure settings.
12. Reset the freezestat setting to 6 degrees F (3.3 degrees C) below the leaving chilled water setpoint temperature. See the section titled "Glycol Solutions" on page 24 for additional information concerning glycol.
13. Perform a preliminary leak check before insulating the piping and filling the system.
14. Piping insulation should include a vapor barrier to prevent condensation and possible damage to the building structure.

**⚠ CAUTION**

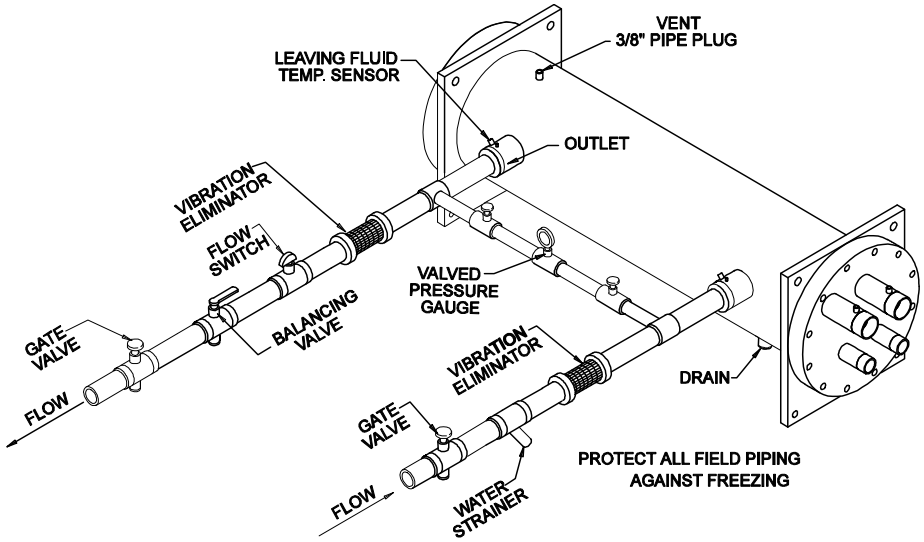
If separate disconnect is used for the 115V supply to the evaporator heating cable, mark the disconnect clearly to ensure the disconnect is not accidentally shut off during cold seasons causing a possible damaging evaporator freeze-up.

***Figure 16, Typical Field Evaporator Water Piping, AGZ 030CH/CB - AGZ 130CH/CB***




**NOTE**: Outdoor piping must be protected if freezing temperatures are a possibility.

***Figure 17, Typical Piping, Shell and Tube Evaporator, AGZ 140CH/CB - AGZ 180CH/CB***




## Flow Switch

Mount a water flow switch in the leaving water line to shut down the unit when water flow is interrupted. A flow switch is an equipment protection control and should never be used to cycle a unit.

A “paddle” type flow switch is available from McQuay (part number 017503300). Certain flow rates are required to open the switch and are listed in Table 12 on page 24. Wire from switch terminals Y and R to the unit control panel terminals shown on the field wiring diagram (page 63).

Installation should be as shown in Figure 18. Connect the normally open contacts of the flow switch in the unit control center at terminals 44 and 61. There is also a set of normally closed contacts on the switch that can be used for an indicator light or an alarm to indicate when a “no flow” condition exists. Freeze protect any flow switch that is installed outdoors. Manufacturer’s instructions included with the switch should be followed.

**NOTE:** Differential pressure switches are not recommended for outdoor installation. They can freeze and not indicate a no-flow condition.

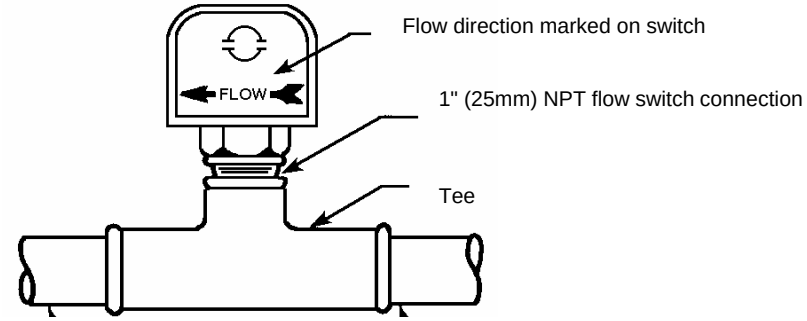
***Table 12, Flow Switch Minimum/Maximum Flow Rates***

| Pipe Size (NOTE !) | | inch | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 | 4 | 5 | 6 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | 32 (2) | 38 (2) | 51 | 63 (3) | 76 | 102 (4) | 127 (4) | 153 (4) | 204 (5) |
| Min. Adjst. | Flow | gpm | 5.8 | 7.5 | 13.7 | 18.0 | 27.5 | 65.0 | 125.0 | 190.0 | 205.0 |
| | | Lpm | 1.3 | 1.7 | 3.1 | 4.1 | 6.2 | 14.8 | 28.4 | 43.2 | 46.6 |
| | No Flow | gpm | 3.7 | 5.0 | 9.5 | 12.5 | 19.0 | 50.0 | 101.0 | 158.0 | 170.0 |
| | | Lpm | 0.8 | 1.1 | 2.2 | 2.8 | 4.3 | 11.4 | 22.9 | 35.9 | 38.6 |
| Max. Adjst. | Flow | gpm | 13.3 | 19.2 | 29.0 | 34.5 | 53.0 | 128.0 | 245.0 | 375.0 | 415.0 |
| | | Lpm | 3.0 | 4.4 | 6.6 | 7.8 | 12.0 | 29.1 | 55.6 | 85.2 | 94.3 |
| | No Flow | gpm | 12.5 | 18.0 | 27.0 | 32.0 | 50.0 | 122.0 | 235.0 | 360.0 | 400.0 |
| | | Lpm | 2.8 | 4.1 | 6.1 | 7.3 | 11.4 | 27.7 | 53.4 | 81.8 | 90.8 |

**NOTES:**

1. A segmented 3-inch paddle (1, 2, and 3 inches) is furnished mounted, plus a 6-inch paddle loose.
2. Flow rates for a 2-inch paddle trimmed to fit the pipe.
3. Flow rates for a 3-inch paddle trimmed to fit the pipe.
4. Flow rates for a 3-inch paddle.
5. Flow rates for a 6-inch paddle

***Figure 18, Flow Switch Installation***




# Water Connections

Bring water piping to the evaporator through the side between the vertical supports. Provide taps for the connection of pressure gauges and thermometers in the inlet and outlet lines. Check the inlet and outlet labels on the unit against the certified drawings supplied on the job and be sure the water piping is hooked up correctly. Contact the McQuay sales office if any discrepancies exist.

# System Water Volume Considerations

All chilled water systems need adequate time to recognize a load change, respond to that load change and stabilize, without undesirable short cycling of the compressors or loss of control. In air conditioning systems, the potential for short cycling usually exists when the building load falls below the minimum chiller plant capacity or on close-coupled systems with very small water volumes.

Some of the things the designer should consider when looking at water volume are the minimum cooling load, the minimum chiller plant capacity during the low load period and the desired cycle time for the compressors.

Assuming that there are no sudden load changes and that the chiller plant has reasonable turndown, a rule of thumb of "gallons of water volume equal to two to three times the chilled water gpm flow rate" is often used.

A properly designed storage tank should be added if the system components do not provide sufficient water volume.

# Glycol Solutions

The use of a glycol/water mixture in the evaporator to prevent freezing will reduce system capacity and efficiency, as well as increase pressure drop. The system capacity, required glycol solution flow rate, and pressure drop with glycol may be calculated using the following formulas and tables.

1. **Capacity** – Multiply the capacity based on water by the *Capacity* correction factor from Table 13 or Table 14.

2. **Flow** – Multiply the water evaporator flow by the *Flow* correction factor from Table 13 or

Table 14 to determine the increased evaporator flow due to glycol.

If the flow is unknown, it can be calculated from the following equation:

$$\text{Glycol Flow (gpm)} = \frac{24 \times \textit{Tons Capacity (glycol)}}{\textit{Delta T}} \times \textit{Flow Correction Factor})$$

For Metric Applications – Use the following equation for metric applications:

$$\text{Glycol Flow (l/s)} = \frac{\textit{kW Capacity}}{4.18 \times \textit{Delta} - T} \times \textit{Flow Correction Factor}$$

3. **Pressure drop** -- Multiply the water pressure drop from Table 16 by *Pressure Drop* correction factor from Table 13 or Table 14. High concentrations of propylene glycol at low temperatures may cause unacceptably high pressure drops.

4. **Power** -- Multiply the water system power by *Power* correction factor from Table 13 or Table 14.

Test coolant with a clean, accurate glycol solution hydrometer (similar to that found in service stations) to determine the freezing point. Obtain percent glycol from the freezing point table below. It is recommended that a minimum of 25% solution by weight be used for protection against corrosion or that additional compatible inhibitors be added. Concentrations above 35 percent do not provide any additional burst protection and should be carefully considered before using.

**⚠ CAUTION**

Do not use an automotive-grade antifreeze. Industrial grade glycols must be used. Automotive antifreeze contains inhibitors which will cause plating on the copper tubes within the chiller evaporator. The type and handling of glycol used must be consistent with local codes.

***Table 13, Ethylene Glycol Factors***

| % E.G. | Freeze Point | | Capacity | Power | Flow | PD |
|---|---|---|---|---|---|---|
| | °F | °C | | | | |
| **10** | 26 | -3.3 | 0.998 | 0.998 | 1.036 | 1.097 |
| **20** | 18 | -7.8 | 0.993 | 0.997 | 1.060 | 1.226 |
| **30** | 7 | -13.9 | 0.987 | 0.995 | 1.092 | 1.369 |
| **40** | -7 | -21.7 | 0.980 | 0.992 | 1.132 | 1.557 |
| **50** | -28 | -33.3 | 0.973 | 0.991 | 1.182 | 1.791 |

***Table 14, Propylene Glycol Factors***

| % P.G. | Freeze Point | | Capacity | Power | Flow | PD |
|---|---|---|---|---|---|---|
| | °F | °C | | | | |
| **10** | 26 | -3.3 | 0.995 | 0.997 | 1.016 | 1.100 |
| **20** | 19 | -7.2 | 0.987 | 0.995 | 1.032 | 1.211 |
| **30** | 9 | -12.8 | 0.978 | 0.992 | 1.057 | 1.380 |
| **40** | -5 | -20.6 | 0.964 | 0.987 | 1.092 | 1.703 |
| **50** | -27 | -32.8 | 0.952 | 0.983 | 1.140 | 2.251 |
| **50** | -28 | -33.3 | 0.939 | 0.983 | 1.184 | 1.755 |

## Pumpdown

The pumpdown capacity of AGZ units is given in the Physical Data Tables starting on page 37. Care should be exercised to include all equipment and lines when calculating the system charge relative to pumpdown capacity on remote evaporator units. The AGZ remote evaporators have an insignificant operating charge but the piping can hold a considerable amount of refrigerant.

## Altitude Correction Factors

Performance tables are based at sea level. Elevations other than sea level affect the performance of the unit. The decreased air density will reduce condenser capacity consequently reducing the unit's performance. For performance at elevations other than sea level, refer to Table 15.

## Evaporator Temperature Drop Factors

Performance tables are based on a 10-degree F (5-degree C) temperature drop through the evaporator. Adjustment factors for applications with temperature ranges from 6 to 16-degree F (3.3 to 8.9-degree C) are in Table 15.

Temperature drops outside this 6 to 16-degree F (3.3 to 8.9-degree C) range can affect the control system's capability to maintain acceptable control and are not recommended.

The maximum water temperature that can be circulated through the evaporator in a non-operating mode is 100°F (37.8°C).

## Fouling Factor

Performance tables are based on water with a fouling factor of:

$0.0001 ft^2 \times hr \times °F / BTU \quad or \quad (0.0176 m^2 \times °C / kW)$

per ARI 550/590-98.

As fouling is increased, performance decreases. For performance at other than 0.0001 (0.0176) fouling factor, refer to Table 15.

Foreign matter in the chilled water system will adversely affect the heat transfer capability of the evaporator and could increase the pressure drop and reduce the water flow. Maintain proper water treatment to provide optimum unit operation.

***Table 15, Capacity and Power Derates, Models AGZ CH/CB***

| Altitude | Chilled Water Delta T | | Fouling Factor | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.0001 (0.0176) | | 0.00025 (0.044) | | 0.00075 (0.132) | | 0.00175 (0.308) | |
| | °F | °C | Cap. | Power | Cap. | Power | Cap. | Power | Cap. | Power |
| Sea Level | 6 | 3.3 | 0.978 | 0.993 | 0.975 | 0.991 | 0.963 | 0.987 | 0.940 | 0.980 |
| | 8 | 4.4 | 0.989 | 0.996 | 0.986 | 0.994 | 0.973 | 0.990 | 0.950 | 0.983 |
| | 10 | 5.6 | 1.000 | 1.000 | 0.996 | 0.999 | 0.984 | 0.994 | 0.961 | 0.987 |
| | 12 | 6.7 | 1.009 | 1.003 | 1.005 | 1.001 | 0.993 | 0.997 | 0.969 | 0.990 |
| | 14 | 7.7 | 1.018 | 1.004 | 1.014 | 1.003 | 1.002 | 0.999 | 0.978 | 0.991 |
| | 16 | 8.9 | 1.025 | 1.007 | 1.021 | 1.006 | 1.009 | 1.001 | 0.985 | 0.994 |
| 2000 feet 610 meters | 6 | 3.3 | 0.977 | 1.001 | 0.973 | 1.000 | 0.961 | 0.996 | 0.938 | 0.989 |
| | 8 | 4.4 | 0.987 | 1.006 | 0.984 | 1.004 | 0.971 | 1.000 | 0.948 | 0.993 |
| | 10 | 5.6 | 0.998 | 1.009 | 0.995 | 1.007 | 0.982 | 1.003 | 0.959 | 0.996 |
| | 12 | 6.7 | 1.007 | 1.011 | 1.004 | 1.010 | 0.991 | 1.006 | 0.967 | 0.998 |
| | 14 | 7.7 | 1.014 | 1.014 | 1.011 | 1.013 | 0.998 | 1.009 | 0.974 | 1.001 |
| | 16 | 8.9 | 1.022 | 1.016 | 1.018 | 1.014 | 1.005 | 1.010 | 0.981 | 1.003 |
| 4000 feet 1220 meters | 6 | 3.3 | 0.973 | 1.011 | 0.970 | 1.010 | 0.957 | 1.006 | 0.935 | 0.998 |
| | 8 | 4.4 | 0.984 | 1.014 | 0.980 | 1.013 | 0.968 | 1.009 | 0.945 | 1.001 |
| | 10 | 5.6 | 0.995 | 1.019 | 0.991 | 1.017 | 0.979 | 1.013 | 0.955 | 1.005 |
| | 12 | 6.7 | 1.004 | 1.021 | 1.000 | 1.020 | 0.987 | 1.016 | 0.964 | 1.008 |
| | 14 | 7.7 | 1.011 | 1.024 | 1.007 | 1.023 | 0.994 | 1.018 | 0.971 | 1.011 |
| | 16 | 8.9 | 1.018 | 1.027 | 1.014 | 1.026 | 1.002 | 1.021 | 0.978 | 1.014 |
| 6000 feet 1830 meters | 6 | 3.3 | 0.969 | 1.021 | 0.966 | 1.020 | 0.954 | 1.016 | 0.931 | 1.008 |
| | 8 | 4.4 | 0.980 | 1.026 | 0.977 | 1.024 | 0.964 | 1.020 | 0.942 | 1.013 |
| | 10 | 5.6 | 0.989 | 1.029 | 0.986 | 1.027 | 0.973 | 1.023 | 0.950 | 1.015 |
| | 12 | 6.7 | 0.998 | 1.033 | 0.995 | 1.031 | 0.982 | 1.027 | 0.959 | 1.020 |
| | 14 | 7.7 | 1.007 | 1.036 | 1.004 | 1.034 | 0.991 | 1.030 | 0.967 | 1.022 |
| | 16 | 8.9 | 1.014 | 1.037 | 1.011 | 1.036 | 0.998 | 1.031 | 0.974 | 1.024 |

# Evaporator Freeze Protection

Evaporator freeze-up can be a concern in the application of air-cooled water chillers. To protect against freeze-up, insulation and an electric heater cable are furnished with the unit. This protects the evaporator down to -20° F (-29°C) ambient air temperature. Although the evaporator is equipped with freeze protection, it does not protect water piping external to the unit or the evaporator itself if there is a power failure or heater cable burnout. Consider the following recommendations for additional protection.

1. If the unit will not be operated during the winter, drain evaporator and chilled water piping and flush with glycol. Drain and vent connections are provided on the evaporator to ease draining.

2. Add a glycol solution to the chilled water system to provide freeze protection. Freeze point should be approximately ten degrees below minimum design ambient temperature.

3. The addition of thermostatically controlled heat and insulation to exposed piping.

4. Continuous circulation of water through the chilled water piping and evaporator.

The evaporator heater cable is factory wired to the 115-volt circuit in the control box. This power should be supplied from a separate source, but it can be supplied from the control circuit. Operation of the heater cable is automatic through the ambient sensing thermostat that energizes the evaporator heater cable for protection against freeze-up. Unless the evaporator is drained in the winter, the disconnect switch to the evaporator heater must not be open.

# Operating/Standby Limits

Maximum standby ambient air temperature, 130° F (55° C)

Maximum operating ambient air temperature

Maximum ambient temperature

- Standard unit, less than 105°F (40.6°C)
- With optional High Ambient Control Panel, 105°F (40.6°C) to 125°F (51.7)

  **Note**: When ambient air temperature is above 100º F, minimum leaving chilled fluid temperature (with antifreeze) is 25°F.

Minimum operating ambient temperature (standard), 35° F (2° C)

Minimum operating temperature (with optional low-ambient control), 0° F (-18° C)

Leaving chilled water temperature, 40° F to 60° F (4.4° C to 15.6° C)

Leaving chilled fluid temperatures (with anti-freeze), 15° F to 60° F (-9.4° C to 15.6° C)

Design chilled water Delta-T range, 6º F to 16º F (3.3º C to 8.9° C)

Part load minimum flow for variable flow systems; varies with unit size, see below

Maximum operating inlet fluid temperature, 76° F (24° C)

Maximum non-operating inlet fluid temperature, 100° F (38° C)

# Panel Ratings

## Optional Electric Panel Ratings

| Voltage | Optional VFD | High Short Circuit Panel | High Interrupt Panel w/ |
|---|---|---|---|
| **208-230** | 5 | 120 | 120 |
| **460** | 5 | 65 | 65 |
| **575** | 5 | 25 | 25 |

## Standard Electric Panel Ratings

| Voltage | 030-035 | 040-080 | 090-100 | 110-125 | 130-160 | 180-190 |
|---|---|---|---|---|---|---|
| **208-230** | 5 | 10 | 10 | 10 | 10 | 10 |
| **460** | 5 | 5 | 10 | 5 | 10 | 10 |
| **575** | 5 | 5 | 5 | 5 | 5 | 10 |

# Pressure Drop Curves

Evaporator pressure drops are in Figure 19 on page 29. They apply to either packaged or remote evaporator applications. Table 16 below contains the evaporator reference letter and the minimum and maximum flows allowed for each unit.

Occasionally the same evaporator is used on multiple units resulting in overlapping lines. The minimum and maximum flows for a given unit will be at the point where the unit reference number appears.

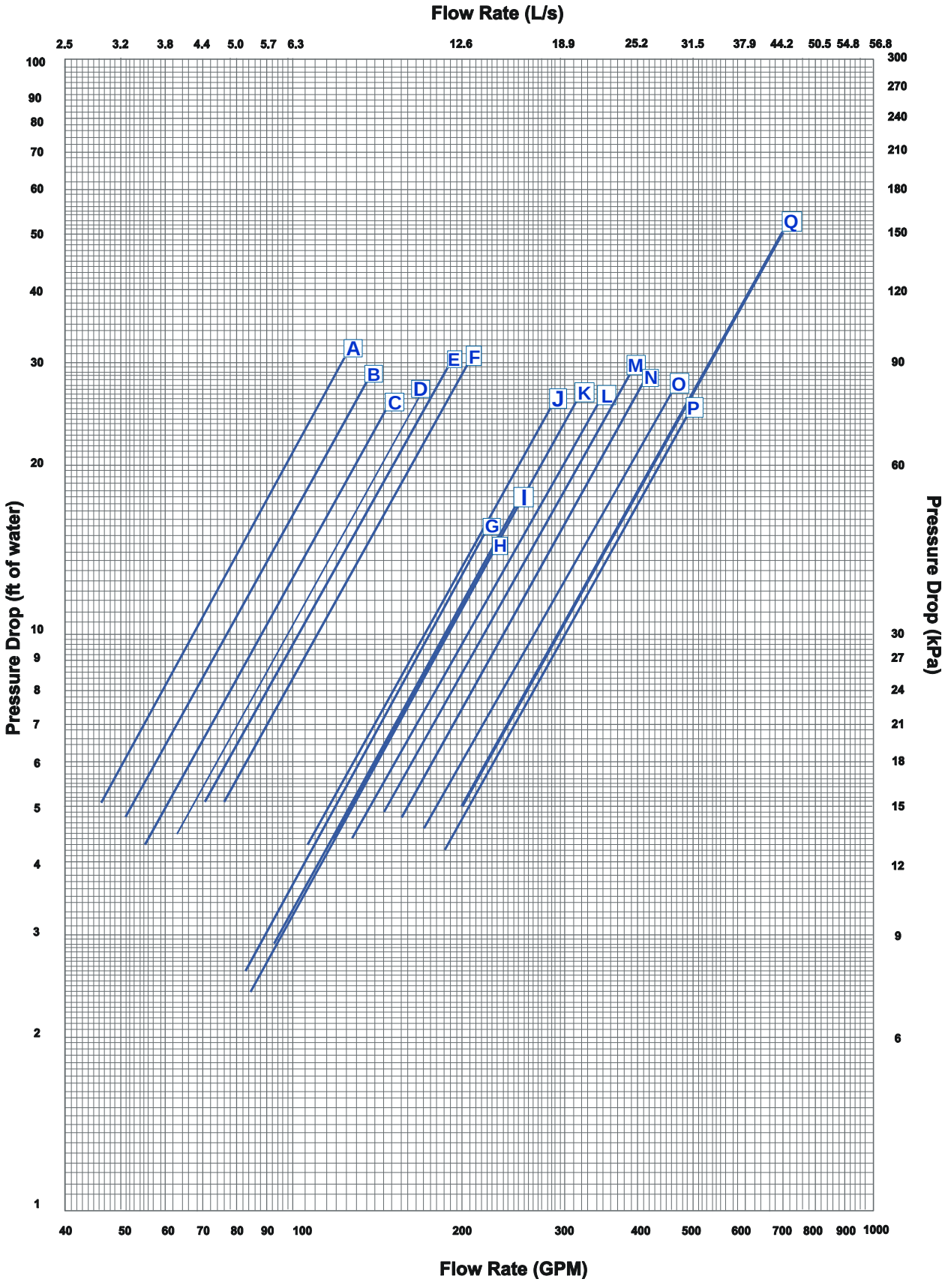
***Table 16, Curve Cross-Reference, Min/Nominal/Max Flows***

| Curve Ref. | AGZ Unit Model | Evap Model | Minimum Flow Rate | | | | Nominal Flow Rate | | | | Maximum Flow Rate | | | | Nom Tons |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Inch-Pound | | S.I. | | Inch-Pound | | S.I. | | Inch-Pound | | S.I. | | |
| | | | gpm | DP ft. | lps | DP kpa | gpm | DP ft. | lps | DP kpa | gpm | DP ft. | lps | DP kpa | |
| **A** | **030C** | ACH130-90DQ | 47.3 | 5.1 | 3.0 | 15.4 | 75.6 | 12.0 | 4.8 | 35.9 | 126.0 | 30.1 | 8.0 | 90.0 | 31.5 |
| **B** | **035C** | ACH130-102DQ | 51.2 | 4.8 | 3.2 | 14.2 | 81.8 | 11.1 | 5.2 | 33.2 | 136.4 | 27.9 | 8.6 | 83.3 | 34.1 |
| **C** | **040C** | ACH130-118DQ | 55.7 | 4.3 | 3.5 | 12.8 | 89.0 | 10.0 | 5.6 | 29.9 | 148.4 | 25.1 | 9.4 | 75.0 | 37.1 |
| **D** | **045C** | ACH130-138DQ | 63.2 | 4.5 | 4.0 | 13.5 | 101.0 | 10.5 | 6.4 | 31.4 | 168.4 | 26.3 | 10.6 | 78.7 | 42.1 |
| **E** | **050C** | ACH130-158DQ | 71.4 | 5.1 | 4.5 | 15.1 | 114.2 | 11.8 | 7.2 | 35.3 | 190.4 | 29.6 | 12.0 | 88.5 | 47.6 |
| **F** | **055C** | ACH130-178DQ | 77.1 | 5.1 | 4.9 | 15.3 | 123.4 | 11.9 | 7.8 | 35.7 | 205.6 | 30.0 | 13.0 | 89.6 | 51.4 |
| **G** | **060C** | ACH250-110DQ | 82.7 | 2.6 | 5.2 | 7.8 | 132.2 | 6.1 | 8.3 | 18.1 | 220.4 | 15.2 | 13.9 | 45.4 | 55.1 |
| **H** | **065C** | ACH250-122DQ | 85.7 | 2.4 | 5.4 | 7.2 | 137.0 | 5.6 | 8.6 | 16.8 | 228.4 | 14.1 | 14.4 | 42.0 | 57.1 |
| **I** | **070C** | ACH250-122DQ | 93.4 | 2.9 | 5.9 | 8.6 | 149.5 | 6.8 | 9.4 | 20.2 | 249.1 | 16.8 | 15.8 | 50.5 | 62.3 |
| **J** | **075C** | ACH350-118DQ | 107.4 | 4.3 | 6.8 | 13.0 | 171.8 | 10.1 | 10.8 | 30.3 | 286.4 | 25.4 | 18.1 | 75.9 | 71.6 |
| **K** | **080C** | ACH350-126DQ | 119.3 | 4.4 | 7.5 | 13.2 | 190.8 | 10.3 | 12.0 | 30.7 | 318.0 | 25.7 | 20.1 | 76.9 | 79.5 |
| **L** | **090C** | ACH350-142DQ | 129.4 | 4.3 | 8.1 | 13.0 | 207.1 | 10.1 | 13.0 | 30.1 | 345.2 | 25.2 | 21.8 | 75.5 | 86.3 |
| **M** | **100C** | ACH350-150DQ | 146.7 | 4.9 | 9.2 | 14.7 | 234.7 | 11.4 | 14.8 | 34.3 | 391.2 | 28.7 | 24.7 | 85.9 | 97.8 |
| **N** | **110C** | ACH350-162DQ | 156.3 | 4.8 | 9.9 | 14.3 | 250.1 | 11.1 | 15.8 | 33.3 | 416.8 | 27.9 | 26.3 | 83.5 | 104.2 |
| **O** | **125C** | ACH350-182DQ | 171.5 | 4.6 | 10.8 | 13.8 | 274.3 | 10.8 | 17.3 | 32.1 | 457.2 | 27.0 | 28.8 | 80.6 | 114.3 |
| **P** | **130C** | ACH350-210DQ | 187.1 | 4.2 | 11.8 | 12.5 | 299.3 | 9.8 | 18.9 | 29.1 | 498.8 | 24.5 | 31.5 | 73.1 | 124.7 |
| **Q** | **140C** | EV34191111/9 | 200.6 | 5.0 | 12.7 | 15.0 | 320.9 | 11.8 | 20.2 | 33.1 | 534.8 | 29.5 | 33.7 | 88.0 | 133.7 |
| **Q** | **160C** | EV34191111/9 | 227.3 | 6.3 | 14.3 | 18.9 | 363.6 | 14.7 | 22.9 | 41.5 | 606.0 | 36.8 | 38.2 | 110.2 | 151.5 |
| **Q** | **180C** | EV34191111/9 | 254.0 | 7.7 | 16.0 | 22.9 | 406.3 | 18.0 | 25.6 | 50.8 | 677.2 | 45.1 | 42.7 | 134.6 | 169.3 |
| **Q** | **190C** | EV34191212/7 | 270.2 | 9.4 | 17.0 | 28.0 | 432.2 | 22.0 | 27.2 | 62.1 | 720.3 | 55.1 | 45.4 | 164.4 | 180.1 |

NOTE: Evaporators beginning with ACH are brazed-plate; those beginning with EV are shell-and-tube.

***Figure 19, Evaporator Pressure Drops***

See previous page for curve cross-reference and min/max flow rates.



# Wind Baffles and Hail Guards

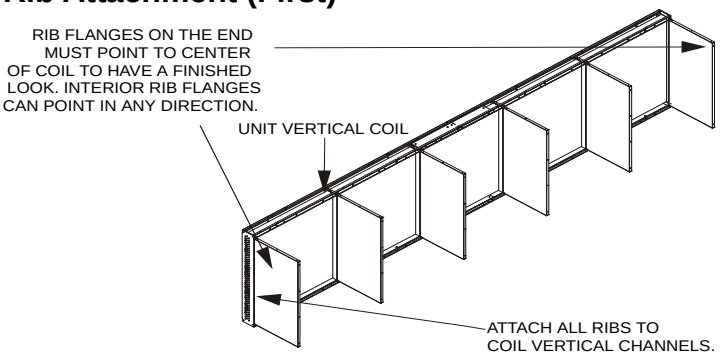
Protection against negative effects from wind and protection against fin damage from hail can be achieved from two separate options from McQuay. Factory or field installed louvers are available as well as the box-type enclosures described below.

Wind Baffles/Hail Guards are a field-installed option that are used to stabilize unit operation in high wind areas and to assist in operation at low ambient temperatures.

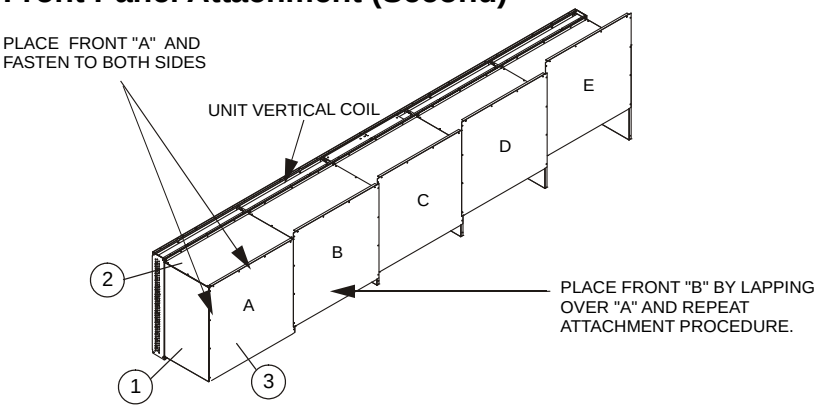
Figure 20 is a sketch of a typical panel assembly on an AGZ unit. The actual number of panels and parts will vary by model size, being one set per fan, on each side (see Physical Data tables for number of fans). The parts are shown in the table below and referenced by balloon numbers.

**Figure 20, Installation Sequence**

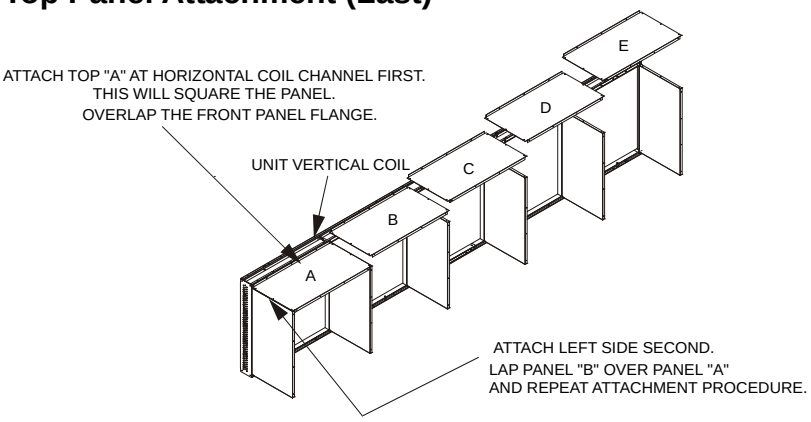
## Rib Attachment (First)


RIB FLANGES ON THE END MUST POINT TO CENTER OF COIL TO HAVE A FINISHED LOOK. INTERIOR RIB FLANGES CAN POINT IN ANY DIRECTION.
UNIT VERTICAL COIL
ATTACH ALL RIBS TO COIL VERTICAL CHANNELS.

## Front Panel Attachment (Second)



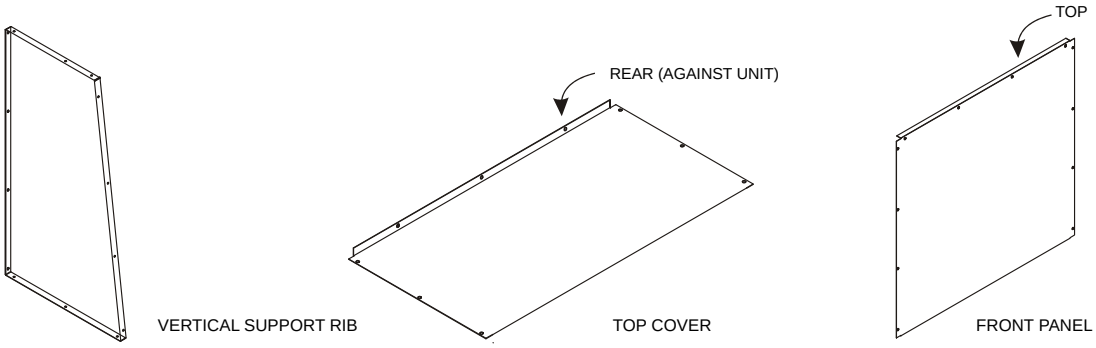

## Top Panel Attachment (Last)

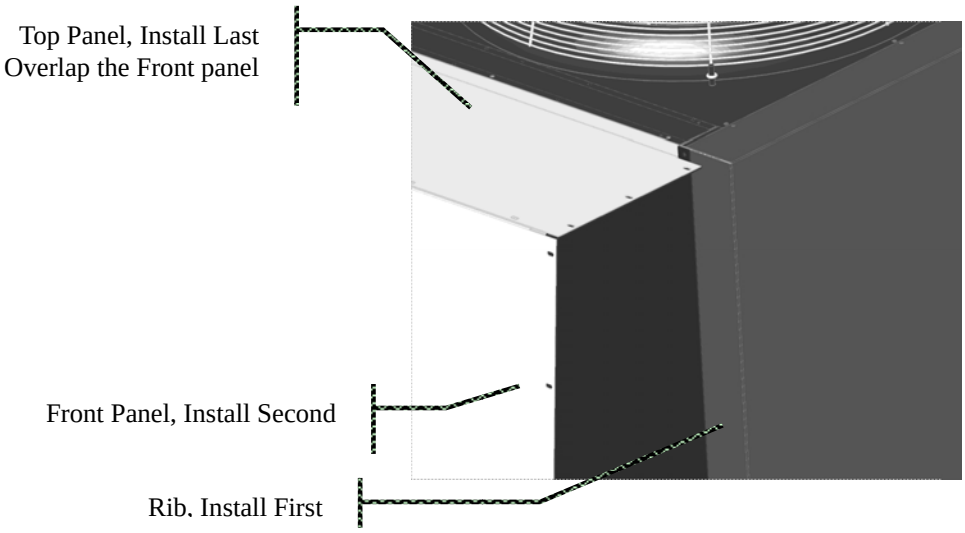

ATTACH TOP "A" AT HORIZONTAL COIL CHANNEL FIRST. THIS WILL SQUARE THE PANEL. OVERLAP THE FRONT PANEL FLANGE.
UNIT VERTICAL COIL
A
B
C
D
E
ATTACH LEFT SIDE SECOND. LAP PANEL "B" OVER PANEL "A" AND REPEAT ATTACHMENT PROCEDURE.

### *Table 17, Packing List*

| Description | Part Number | Bubble Number |
|---|---|---|
| Vertical Support Rib | 074758501 | 1 |
| Top Cover | 330409401 | 2 |
| Front Panel | 330409501 | 3 |
| ¼ - 20 x ½" Screw (Place in Poly Bag) | 046093807 | |

### *Figure 21, Components*



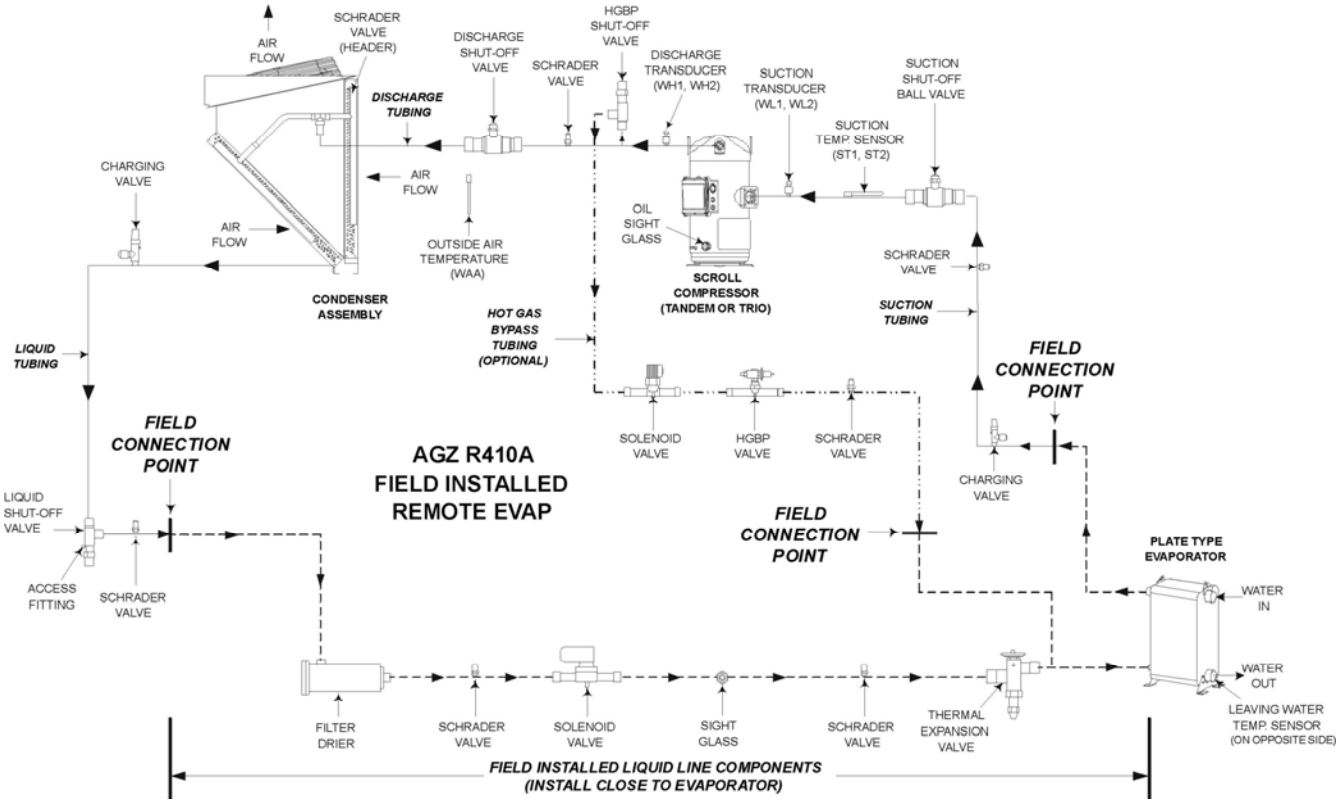
# Remote Evaporator

## AGZ Staging and Circuiting

All AGZ units have two circuits, each with either two compressors, or three compressors. These circuits must be kept separated throughout the entire refrigerant piping system. Pipe all lines (suction, liquid and hot gas bypass, if used) of each evaporator circuit to a circuit on the outdoor unit. Be careful not to cross-pipe any lines.

Evaporator coil #1 must be piped to the condensing unit circuit #1. Evaporator coil #2 must be piped to the condensing unit circuit #2. See dimension drawings beginning on page 65 for circuit locations.

***Figure 22, Model AGZ 030C to 130C, Remote Evaporator Schematic Piping Diagram***




NOTES:

1. Models AGZ 140C to 190C have the same piping arrangement, but with a shell-and-tube evaporator.
2. Models 030 to 130 have TXV valves only, Models 140 to 190 have EXV valves only.

## Refrigerant Specialties:

Refrigerant specialties including the expansion valves (Models 030 to 130 have TXV valves, Models 140 to 190 have EXV valves), solenoid valves, filter-drier and sight glasses for use with the AGZ-BM remote evaporator models are supplied by McQuay but require field installation. The remaining components including fittings and Schrader valves are provided and piped by the installer.

The hot gas bypass valve with solenoid valve option can be provided as a field-installed or factory installed option.

Unit-Mounted Valves: The AGZ-C have a liquid line shutoff valve and a suction shutoff valve factory mounted as standard.

## Refrigerant Piping

All field piping, wiring, and procedures must be performed in accordance with ASHRAE, EPA, and industry standards. Proper refrigerant piping can make the difference between a reliable system and an inefficient, problematic system. The recommended source for refrigerant piping techniques and sizing is the ASHRAE 2002 Refrigeration Handbook, chapter 2.

The primary concerns related to piping are refrigerant pressure drop, a solid liquid feed to the expansion valves, continuous oil return and properly sized refrigerant specialties.

Insulate the suction line to reduce excessive superheat build-up. Insulate the liquid line, where located in areas above ambient temperature, to prevent loss of subcooling and consequent liquid flashing.

A holding charge of nitrogen/helium is provided for the outdoor section. The brazed-plate evaporators on Models 030 to 130 have no charge and are not sealed. The shell-and-tube evaporators on Models 140 to 180 have a nitrogen holding charge. Holding charges must be removed prior to the R-410a charging procedure. The installer must properly evacuate the piping system and provide the operating charge of R-410A.

Although conflicting piping recommendations can be found in different sources, McQuay offers the following recommendations for these controversial issues.

The use of double risers for vertical gas risers is generally not recommended. Slightly downsizing the vertical riser is a preferable option to providing double risers. Follow ASHRAE procedures.

Slope the refrigerant lines 1” per 10 feet of horizontal run in the direction of refrigerant flow to assist oil return.

Resist using hot gas bypass for applications when operation in ambient temperature below 40 degrees is expected. This recommendation helps to maintain adequate condensing pressures and liquid refrigerant at the expansion valve when condenser capacities are at their maximum.

Pressure drops in the refrigerant lines should be maintained at or below the ASHRAE recommendations and line lengths should be made as short as possible. Exceeding these recommendations will decrease performance and could impact reliability.

Small traps should be provided at the base of each major vertical gas riser to assist in the collection of oil. If vertical risers exceed more than 25 feet, install a small trap at the midpoint and at a maximum of 20 foot intervals.

Use caution in sizing the liquid line in applications where the evaporator is above the outdoor section. The weight of the liquid refrigerant in the vertical column will decrease the pressure at the top of the riser (approximately 0.5 psi per foot of vertical rise) allowing some of the refrigerant to flash to a gas. Adequate refrigerant subcooling is needed at the outdoor section to prevent large volumes of refrigerant gas at the expansion valve.

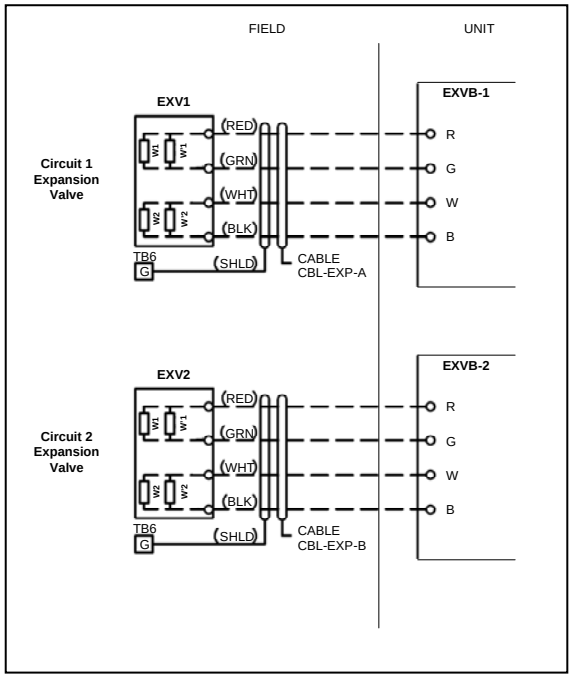
The piping systems should always extend above the highest component in the refrigeration system before dropping down to make the final refrigerant connections to components. This practice will hinder the draining of condensed refrigerant to the lower component when normal shutdown procedures do not occur (such as a power failure).

## Wiring for AGZ-Remote Evaporators

1. The two electronic expansion valves (AGZ 140 to 190 only) have a 30-foot long cable attached that can be used, as is, when the outdoor unit is less than 30 feet away. Beyond that, a junction box must be located within 30 feet of the evaporator, and up to an additional 70 feet of 14GA wire connected from the cable to the unit.

   Models 030 to 130 have TXV valves only, Models 140 to 190 have EXV valves only. Units with thermal expansion valves (TXV) do not require wiring. See the following diagram. Color coding must be followed at the expansion valve driver in the control panel.

***Figure 23, EXV Field Wiring***




2. There is one evaporator leaving water temperature sensor with 100 feet of cable coiled in the unit behind the control panel for extension to the evaporator and insertion in fitting located on the outlet nozzle on AGZ 140 to 190 models. For models AGZ 030 to 130 with brazed-plate evaporators, , the sensor is inserted into back of heat exchanger, opposite the water connections, at the designated leaving water temperature sensor location.

3. There is one suction line refrigerant temperature sensor per circuit with 100 feet of cable coiled, installed on suction line behind the unit control panel intended for extension to the evaporator. Place the sensor in a brazed well (provided in kit, installed in the field) on the suction line in a straight-flat area, close to the suction line pressure transducer. Install with heat conductive compound and insulate well. If installed on a horizontal pipe run, locate between the 2-4 o'clock positions.

   **NOTE:** If the evaporator is located within 30 linear feet of piping from the outdoor unit, the two suction temperature sensors can be left on the outdoor unit factory suction line as shipped.

4. One suction line pressure transducer per circuit with 100 feet of cable coiled, installed on suction line behind the unit control panel for extension to the evaporator. Mount the transducer in the suction line, 2-3 feet from the evaporator head, on the top or side of the pipe. Connection is ¼-inch flare with a flare Schrader.

   **NOTE:** If the evaporator is located within 30 linear feet of piping from the outdoor unit, the two suction pressure transducers can be left on the outdoor unit factory suction line as shipped.

5. One solenoid valve per circuit must be wired to the unit control panel. They come equipped with an 8-foot cable that must be added to. See the wiring diagram on page 63 for connection points at unit.

### Pumpdown

The pumpdown capacity of AGZ units is given in the Physical Data Tables starting on page 37. Care should be exercised to include all equipment and lines when calculating the system charge relative to the unit's pumpdown (storage) capacity. The AGZ-CB remote evaporators have an insignificant operating charge. It is important that the liquid line solenoid valve be located close to the evaporator so that pump down does not have to remove and store a large quantity of liquid refrigerant from the liquid line.

# Optional Features

## Controls

### Hot Gas Bypass

Hot gas bypass permits unit operation down to 10% of full load capacity. This option includes a factory-mounted hot gas bypass valve, solenoid valve, and manual shutoff valve for each circuit. See page 79 for further information.

### Head Pressure Control

Optional fan VFD control allows unit operation down to -10°F (-23.3°C). (Not available on 380 volt, 60 Hertz units.)

### Water Flow Switch

(P/N 017503300) A water flow switch is available for field installation in the chilled water piping to avoid evaporator freeze-up under low or no flow conditions. Terminals are provided in the unit control center for field hook-up of the water flow switch. If this option is not ordered with the unit, then a field supplied water flow switch must be installed.

### Alarm Bell

Bell for field installation and wiring to the control panel to provide remote indication of unit alarm condition. See Field Wiring Diagram for connection locations.

## BAS Interface

The optional Open Choices™ feature, connection to the chiller for all building automation systems (BAS) protocols, will be at the unit controller. An interface module, depending on the protocol being used, may have been factory-installed in the unit controller (or it can be field installed).

### Protocols Supported

***Table 18, Standard Protocol Data***

| Protocol | Physical Layer | Data Rate | Controller | Other |
|---|---|---|---|---|
| BACnet®/IP or BACnet/Ethernet | Ethernet 10 Base-T | 10 Megabits/sec | MicroTech II | Reference ED 15062 |
| BACnet MSTP | RS-485 | 9600, 19200 or 38400 bits/sec | MicroTech II | Reference ED 15062 |
| LonTalk® | FTT-10A | 78kbits/sec | MicroTech II | Reference ED 15062 |
| Modbus RTU | RS-485 or RS-232 | 9600 or 19200 bits/sec | MicroTech II | Reference ED 15063 |

The interface kits on the MicroTech II controller are as follows:

- BACnet Kit P/N 350147404: BACnet/IP, BACnet MS/TP, or BACnet Ethernet
- LONWORKS module Kit P/N 350147401: LonTalk (FTT-10A)
- Modbus: Modbus RTU

Optional Open Choices™ BAS interfaces. The locations and interconnection requirements for the various standard protocols are found in their respective installation manuals (current version): Modbus IM 743; LONWORKS IM 735; BACnet IM 736.

Referenced documents may be obtained from the local McQuay sales office, from the local McQuay Factory Service office, or from the McQuay Technical Response Center, located in Staunton, Virginia (540-248-0711).

These documents can also be found on www.mcquay.com under Product Information > (chiller type) > Control Integration.

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# Remote Operator Interface Panel

The box containing the optional remote interface panel will have installation instructions, *IOM- MT II Remote*, in it. The manual is also available for downloading from www.mcquay.com.

# Unit Options

## Vibration Isolators

Spring or rubber-in-shear vibration isolators are available for field installation to reduce vibration transmission through the unit base. See page 12 for detailed information on their installation.

## Protective Base Guards

Optional factory-installed, vinyl-coated welded wire base guards provide all-around lower unit protection on ground level installations. Coil guards are standard.

## Coils

## Copper Fin Condenser Coils

Copper fin condenser coils are available as an option on all models.

## BlackFin Coils

Aluminum fin stock precoated with a phenolic coating with 1000 hour salt spray resistance (ASTM B117-90).

## Coated Fins

Copper or aluminum fins coated with *ElectroFin*® baked epoxy protective coating with 3000+ hour salt spray resistance (ASTM B117-90).

## Evaporator Insulation

Double insulation thickness (total of 1½ inches) for high humidity areas or low fluid temperatures.

## Sound Reduction

Acoustical blankets are factory-installed on each compressor.

## Hail and Wind Guards

A field-mounted option that is shipped as a kit including panels, fasteners, and instructions. See page 30 for further information.

## Louvers

Upper and/or lower, factory mounted or field installed louver panels that protect from hail damage, help stabilize operation in high wind conditions and provide a uniform, enhanced appearance.

## Shut-off Valves

Factory-mounted suction shut-off valves, discharge and liquid line shutoff valves are standard.

## Electrical

## Single-Point Electrical Connection

Provides a single-point power connection in lieu of the standard two-point connection. .

## Disconnect Switch with Through-the-Door Handle

A factory or field-installed option for service use, nonfused disconnect switch (mounted inside the power section of the control box) with a through-the-door handle is available with single and multi-point power supply.

## Phase Loss/Voltage Protection

Phase loss with under/over voltage protection and multiple LED indication of fault type is available as a factory-installed option to guard against compressor motor burnout.

## Convenience Outlet

10.0 amp, 115-volt outlet located in control panel to provide power for servicing unit.

## Ground Fault Protection

Protects equipment from damage from line-to-ground fault currents less than those required for conductor protection.

## High Short Circuit Current Protection

Provides control panel protection against short circuit currents per the following table:

| **Voltage** | 208 | 240 | 460 | 600 |
|---|---|---|---|---|
| **Current (kA)** | 100 | 100 | 65 | 25 |

## High Ambient Control Panel

Consists of exhaust fan with rain hood, two inlet screens with filters, necessary controls and wiring to allow operation to 125°F. The option can be factory or field installed as a kit. It is automatically included on any unit with the fan VFD (low ambient option); It is required on any unit operating at 105°F (40.1°C) up to 125°F (51.7C).

- The standard unit controller may limit compressor operation at high ambient temperatures.

# Physical Data

## Packaged

### *Table 19, AGZ 030CH through 040CH, R-410A*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | 030C | | 035C | | 040C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI (1), Tons (kW) | 31.5 (110.7) | | 34.1 (119.9) | | 37.1 (130.4) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, Lbs. | 30 | 30 | 30 | 30 | 39 | 39 |
| Unit Operating Charge, R-410A, (kg) | 13.6 | 13.6 | 13.6 | 13.6 | 17.7 | 17.7 |
| Cabinet Dimensions, LxWxH, In. | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lb (kg) | 3195 (1449) | | 3205 (1454) | | 3285 (1490) | |
| 3285 (1490)Unit Shipping Weight, Lb (kg) | 3180 (1442) | | 3185 (1445) | | 3265 (1481) | |
| Add'l Weight If Copper Finned Coils, Lb (kg) | 284 (129) | | 288 (130) | | 288 (130) | |
| **COMPRESSORS** | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 8.5 | 8.5 | 8.5 | 10.0 | 10.0 | 10.0 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, Oz. | 110 | 110 | 110 | 110 | 110 | 110 |
| Oil Charge Per Compressor, (g) | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 23-50-73-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 27-50-73-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | |
| Coil Face Area Sq. Ft. | 26.3 | 26.3 | 26.3 | 26.3 | 44.1 | 44.1 |
| Coil Face Area, ($M^2$) | 2.4 | 2.4 | 2.4 | 2.4 | 4.1 | 4.1 |
| Finned Height x Finned Length, (In.) | 50x75.6 | 50x75.6 | 50x75.6 | 50x75.6 | 42x75.6 | 42x75.6 |
| Finned Height x Finned Length, (mm) | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1067 x 1920 | 1067 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 2 | 16 x 2 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 40 (18) | 40 (18) | 40 (18) | 40 (18) | 47 (21) | 47 (21) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | |
| Number Of Fans - Fan Diameter, In. (mm) | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (Note 2) | 4 – 1.5 | | 4 – 1.5 | | 4 – 1.5 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (M/Sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 24,316 (11,478) | | 39,600 (18,692) | | 39,600 (18,692) | |
| **EVAPORATOR - BRAZED PLATE-TO-PLATE** | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 1.9 (7.14) | | 2.2 (8,3) | | 2.4 (9.1) | |
| Maximum Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Max. Refrig. Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Conn. In. (mm) | 2.5 (65) | | 2.5 (65) | | 2.5 (65) | |
| Drain - NPT int, In. (mm) | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, In. (mm) | Field Piping | | Field Piping | | Field Piping | |

**NOTES:**
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.

### *Table 20, AGZ 045CH through 060CH, R-410A*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 045C | | 050C | | 055C | | 060C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 42.1 (148.0) | | 47.6 (167.4) | | 51.4 (180.7) | | 55.1 (193.7) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, (lbs.) | 44 | 44 | 50 | 50 | 52 | 52 | 54 | 54 |
| Unit Operating Charge, R-410A, (kg) | 20.2 | 20.2 | 23 | 23 | 24 | 24 | 25 | 25 |
| Cabinet Dimensions, LxWxH, (in.) | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100. | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 3445 (1563) | | 3525 (1599) | | 3555 (1613) | | 3760 (1706) | |
| Unit Shipping Weight, Lbs. (kg) | 3420 (1551) | | 3495 (1585) | | 3525 (1599) | | 3710 (1683) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 476 (216) | | 476 (216) | | 476 (216) | | 568 (258) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 11.5 | 11.5 | 13.0 | 13.0 | 13.0 | 15.0 | 15.0 | 15 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, (oz.) | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| Oil Charge Per Compressor, (g) | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-25-50-75-100 | | 0-23-50-73-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-25-50-75-100 | | 0-27-50-77-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area, (sq. ft.) | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 |
| Coil Face Area , (sq. m) | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 |
| Finned Height x Finned Length, (in.) | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 |
| Finned Height x Finned Length, (mm) | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (Note 2) | 4 – 1.5 | | 4 – 1.5 | | 4 – 1.5 | | 4 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 39,600 (18,692) | | 39,600 (18,692) | | 37,228 (17,572) | | 43,452 (20,510) | |
| **EVAPORATOR - BRAZED PLATE-TO-PLATE** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 2.9 (11.0) | | 3.4 (12.8) | | 3.7 (14.0) | | 5.8 (22.1) | |
| Maximum Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Maximum Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Connections, in. (mm) | 2.5 (65) | | 2.5 (65) | | 2.5 (65) | | 3 (80) | |
| Drain - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |

**NOTES**

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.

### *Table 21, AGZ 065CH through 070CH, R-410A*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | |
|---|---|---|---|---|
| | 065C | | 070C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 57.1 (200.8) | | 62.3 (219.1) | |
| Number Of Refrigerant Circuits | 2 | | 2 | |
| Unit Operating Charge, R-410A, lbs. | 58 | 58 | 60 | 60 |
| Unit Operating Charge, R-410A, (kg) | 26 | 26 | 27 | 27 |
| Cabinet Dimensions, LxWxH, in. | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 3795 (1721) | | 4205 (1907) | |
| (1907Unit Shipping Weight, Lbs. (kg) | 3740 (1696) | | 4150 (1882) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 568 (258) | | 568 (258) | |
| **COMPRESSORS** | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 15 | 15 | 15/20 | 15/20 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, oz. | 110 | 110 | 110/158 | 110/158 |
| Oil Charge Per Compressor, (g) | 3119 | 3119 | 3119/ 4479 | 3119/ 4479 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-21-50-71-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-28-50-78-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | |
| Coil Face Area, sq. ft. | 52.6 | 52.6 | 52.6 | 52.6 |
| Coil Face Area , sq. m | 4.9 | 4.9 | 4.9 | 4.9 |
| Finned Height x Finned Length, in. | 50x75.6 | 50x75.6 | 50x75.6 | 50x75.6 |
| Finned Height x Finned Length, (mm) | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 81 (37) | 81 (37) | 81 (37) | 81 (37) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (2) | 4 – 2.0 | | 4 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 43,452 (20,510) | | 43,452 (20,510) | |
| **EVAPORATOR - BRAZED PLATE-TO-PLATE** | | | | |
| Number of Evaporators | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | |
| Water Volume, Gallons, (L) | 6.4 (24.3) | | 6.4 (24.3) | |
| Maximum Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | |
| Maximum Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Connections, in. (mm) | 3 (80) | | 3 (80) | |
| Drain - NPT int, in. (mm) | Field Piping | | Field Piping | |
| Vent - NPT int, in. (mm) | Field Piping | | Field Piping | |

**NOTES**

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60 for AGZ 060, HP = 2.0
3. Water connection shown is nominal pipe size.

## *Table 22, AGZ 075CH through 100CH, R-410A*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 075C | | 080C | | 090C | | 100C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 71.6 (251.7) | | 79.5 (279.5) | | 86.3 (303.4) | | 97.8 (343.9) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, lbs. | 75 | 75 | 80 | 80 | 86 | 86 | 88 | 88 |
| Unit Operating Charge, R-410A, (kg) | 34.3 | 34.3 | 36 | 36 | 39 | 39 | 40 | 40 |
| Cabinet Dimensions, LxWxH, in. | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 5510 (2499) | | 5600 (2540) | | 5710 (2590) | | 5815 (2638) | |
| Unit Shipping Weight, Lbs. (kg) | 5460 (2477) | | 5545 (2515) | | 5645 (2561) | | 5750 (2608) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 870 (395) | | 870 (395) | | 870 (395) | | 870 (395) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 20 | 20 | 20 | 25 | 25 | 25 | 25/30 | 25/30 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, oz. | 158 | 158 | 158 | 230 | 230 | 230 | 230/213 | 230/213 |
| Oil Charge Per Compressor, (g) | 4479 | 4479 | 4479 | 6520 | 6520 | 6520 | 6520/ 6038 | 6520/ 6038 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-22-50-72-100 | | 0-25-50-75-100 | | 0-22-50-72-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-28-50-78-100 | | 0-25-50-75-100 | | 0-22-50-72-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area, sq. ft. | 66.2 | 66.2 | 66.2 | 66.2 | 78.8 | 78.8 | 78.8 | 78.8 |
| Coil Face Area, ($m^2$) | 6.1 | 6.1 | 6.1 | 6.1 | 7.3 | 7.3 | 7.3 | 7.3 |
| Finned Height x Finned Length, in. | 42 x113.4 | 42 x113.4 | 42 x113.4 | 42 x113.4 | 50 x113.4 | 50 x113.4 | 50 x113.4 | 50 x113.4 |
| Finned Height x Finned Length, (mm) | 1069 x 2880 | 1069 x 2880 | 1069 x 2880 | 1069 x 2880 | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 111 (50) | 111 (50) | 111 (50) | 111 (50) | 130 (59) | 130 (59) | 130 (59) | 130 (59) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 6 – 30 (762) | | 6 – 30 (762) | | 6 – 30 (762) | | 6 – 30 (762) | |
| Number Of Motors - HP (kW) | 6 – 2.0 | | 6 – 2.0 | | 6 – 2.0 | | 6 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 65,178 (30,765) | | 65,178 (30,765) | | 65,178 (30,765) | | 65,178 (30,765) | |
| **EVAPORATOR – BRAZED PLATE-TO-PLATE** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1, | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 6.4 (24.2) | | 6.6 (24.9) | | 7.5 (28.4) | | 8.0 (30.2) | |
| Max. Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Max. Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet/Outlet Victaulic Conn. in. (mm) | 3 (80) | | 3 (80) | | 3 (80) | | 3 (80) | |
| Drain - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |

**NOTE:**
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.

### *Table 23, AGZ 110CH through 130CH, R-410A*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | 110C | | 125C | | 130C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 104.2 (366) | | 114.3 (402) | | 124.7 (438) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, lbs. | 102 | 102 | 115 | 115 | 115 | 115 |
| Unit Operating Charge, R-410A, (kg) | 46 | 46 | 52 | 52 | 52 | 52 |
| Cabinet Dimensions, LxWxH, in. | 173.1 x 88.0 x 100.4 | | 173.1 x 88.0 x 100.4 | | 173.1 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 4397 x 2235 x 2550 | | 4397 x 2235 x 2550 | | 4397 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 7270 (3298) | | 7500 (3402) | | 7665 (3477) | |
| Unit Shipping Weight, Lbs. (kg) | 7200 (3266) | | 7420 (3366) | | 7570 (3434) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 1155 (524) | | 1155 (524) | | 1155 (524) | |
| **COMPRESSORS** | | | | | | |
| Type | Trio Scrolls | | Trio Scrolls | | Trio Scrolls | |
| Nominal tonnage of each Compressor | 20.0 | 20.0 | 20.0 | 25.0 | 25.0 | 25.0 |
| Number Of Compressors per Circuit | 3 | 3 | 3 | 3 | 3 | 3 |
| Oil Charge Per Compressor, oz. | 158 | 158 | 158 | 230 | 230 | 230 |
| Oil Charge Per Compressor, (g) | 4479 | 4479 | 4479 | 6520 | 520 | 6520 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | |
| Staging, 6 Stages, Circuit #1 in Lead | 0-17-33-50-67-83-100 | | 0-15-33-48-67-81-100 | | 0-17-33-50-67-83-100 | |
| Staging, 6 Stages, Circuit #2 in Lead | 0-17-33-50-67-83-100 | | 0-19-33-52-67-86-100 | | 0-17-33-50-67-83-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | |
| Coil Face Area, sq. ft. | 88.4 | 88.4 | 105.3 | 105.3 | 105.3 | 105.3 |
| Coil Face Area, ($m^2$) | 8.2 | 8.2 | 9.8 | 9.8 | 9.8 | 9.8 |
| Finned Height x Finned Length, in. | 42 x151.6 | 42 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 |
| Finned Height x Finned Length, (mm) | 1069 x 3851 | 1069 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 142/64 | 142/64 | 166/75 | 166/75 | 166/75 | 166/75 |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 8 – 30 (762) | | 8 – 30 (762) | | 8 – 30 (762) | |
| Number Of Motors - HP (kW) | 8 – 2.0 | | 8 – 2.0 | | 8 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 86,904 (41,020) | | 86,904 (41,020) | | 86,904 (41,020) | |
| **EVAPORATOR – BRAZED PLATE-TO-PLATE** | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 8.5 (32.1) | | 9.6 (36.3) | | 10.5 (39.7) | |
| Max. Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Max. Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Conn, in. (mm) | 3 (80) | | 3 (80) | | 3 (80) | |
| Drain - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | |

**NOTE:**
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.

### *Table 24, AGZ 140CH through 190CH, R-410A*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 140C | | 160C | | 180C | | 190C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI (1), Tons (kW) | 133.7 (470) | | 151.5 (533) | | 169.3 (595) | | 180.1 (633) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, Lbs. | 125 | 125 | 130 | 130 | 130 | 130 | 140 | 140 |
| Unit Operating Charge, R-410A, (kg) | 57 | 57 | 59 | 59 | 59 | 59 | 64 | 64 |
| Cabinet Dimensions, LxWxH, (In.) | 218.6 x 88.0 x 100.4 | | 218.6 x 88.0 x 100.4 | | 218.6 x 88.0 x 100.4 | | 256.9 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 5552 x 2235 x 2545 | | 5552 x 2235 x 2545 | | 5552 x 2235 x 2545 | | 6525 x 2235 x 2545 | |
| Unit Operating Weight, Lb (kg) | 9530 (4323) | | 9680 (4391) | | 9830 (4459) | | 11070 (5023) | |
| Unit Shipping Weight, Lb (kg) | 9155 (4153) | | 9320 (4228) | | 9470 (4296) | | 10585 (4803) | |
| Add'l Weight If Copper Finned Coils, Lb (kg) | 1596 (724) | | 1596 (724) | | 1596 (724) | | 1915 (869) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Triple Scrolls | | Triple Scrolls | | Triple Scrolls | | Triple Scrolls | |
| Nominal tonnage of each Compressor | 25 | 25 | 25 | 30 | 30 | 30 | 30 | 30 |
| Number Of Compressors per Circuit | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Oil Charge Per Compressor, (oz.) | 230 | 230 | 230 | 213 | 213 | 213 | 213 | 213 |
| Oil Charge Per Compressor, (g) | 6520 | 6520 | 6520 | 6038 | 6038 | 6038 | 6038 | 6038 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 6 Stages, Circuit #1 in Lead | 0-17-33-50-67-83-100 | | 0-15-33-48-67-81-100 | | 0-17-33-50-67-83-100 | | 0-17-33-50-67-83-100 | |
| Staging, 6 Stages, Circuit #2 in Lead | 0-17-33-50-67-83-100 | | 0-19-33-52-67-86-100 | | 0-17-33-50-67-83-100 | | 0-17-33-50-67-83-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area (Sq. Ft.) | 131.8 | 131.8 | 131.8 | 131.8 | 131.8 | 131.8 | 158.3 | 158.3 |
| Coil Face Area, ($M^2$) | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 14.7 | 14.7 |
| Finned Height x Finned Length, (In.) | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 228 | 50 x 228 |
| Finned Height x Finned Length, (mm) | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 5791 | 1270 x 5791 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 202 (92) | 202 (92) | 202 (92) | 202 (92) | 202 (92) | 202 (92) | 242 (110) | 242 (110) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, In. (mm) | 10 – 30 (762) | | 10 – 30 (762) | | 10 – 30 (762) | | 12 – 30 (762) | |
| Number Of Motors - HP (kW) | 10 – 2.0 | | 10 – 2.0 | | 10 – 2.0 | | 12 x 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (M/Sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 108,630 (51,268) | | 108,630 (51,268) | | 108,630 (51,268) | | 130,356 (61,522) | |
| **EVAPORATOR - SHELL-AND-TUBE** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Water Volume, Gallons, (L) | 58 (219) | | 58 (219) | | 58 (219) | | 57 (215) | |
| Maximum Water Pressure, psig (kPa) | 152 (1048) | | 152 (1048) | | 152 (1048) | | 152 (1048) | |
| Max. Refrig. Working Pressure, psig (kPa) | 450 (3103) | | 450 (3103) | | 450 (3103) | | 450 (3103) | |
| Water Inlet / Outlet Victaulic Conn. In. (mm) | 8.0 (200) | | 8.0 (200) | | 8.0 (200) | | 8.0 (200) | |
| Drain - NPT int, In. | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | |
| Vent - NPT int, In. | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | |

**NOTE:**
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.

# Remote Evaporator

### *Table 25, AGZ 030CB through 040CB, R-410A*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | 030C | | 035C | | 040C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI (1), Tons (kW) | 31.5 (110.7) | | 34.1 (119.9) | | 37.1 (130.4) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, Lbs. | 30 | 30 | 30 | 30 | 39 | 39 |
| Unit Operating Charge, R-410A, (kg) | 13.6 | 13.6 | 13.6 | 13.6 | 17.7 | 17.7 |
| Cabinet Dimensions, LxWxH, In. | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lb (kg) | 3130 (1420) | | 3130 (1420) | | 3195 (1449) | |
| Unit Shipping Weight, Lb (kg) | 3070 (1393) | | 3070 (1393) | | 3115 (1413) | |
| Add'l Weight If Copper Finned Coils, Lb (kg) | 284 (129) | | 288 (130) | | 288 (130) | |
| **COMPRESSORS** | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 8.5 | 8.5 | 8.5 | 10.0 | 10.0 | 10.0 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, Oz. | 110 | 110 | 110 | 110 | 110 | 110 |
| Oil Charge Per Compressor, (g) | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 23-50-73-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 27-50-73-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | |
| Coil Face Area Sq. Ft. | 26.3 | 26.3 | 26.3 | 26.3 | 44.1 | 44.1 |
| Coil Face Area, ($M^2$) | 2.4 | 2.4 | 2.4 | 2.4 | 4.1 | 4.1 |
| Finned Height x Finned Length, In. | 50x75.6 | 50x75.6 | 50x75.6 | 50x75.6 | 42x75.6 | 42x75.6 |
| Finned Height x Finned Length, (mm) | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1067 x 1920 | 1067 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 2 | 16 x 2 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 40 (18) | 40 (18) | 40 (18) | 40 (18) | 47 (21) | 47 (21) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | |
| Number Of Fans - Fan Diameter, In. (mm) | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (Note 2) | 4 – 1.5 | | 4 – 1.5 | | 4 – 1.5 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (M/Sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 24,316 (11,478) | | 39,600 (18,692) | | 39,600 (18,692) | |
| | | | | | | |
| **REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE** | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Evaporator Model | ACH130-90DQ | | ACH130-102DQ | | ACH130-118DQ | |
| Dry Weight lbs (kg) | 99 (45) | | 110 (50) | | 126 (57) | |
| Water Volume, Gallons, (L) | 1.9 (7.14) | | 2.2 (8,3) | | 2.4 (9.1) | |
| Maximum Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Max. Refrig. Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Conn. In. (mm) | 2.5 (65) | | 2.5 (65) | | 2.5 (65) | |
| Drain - NPT int, In. (mm) | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, In. (mm) | Field Piping | | Field Piping | | Field Piping | |

**NOTES:**

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.
4. Units shipped with a holding charge of nitrogen and helium. Operating charge quantity shown must be charged in the field plus field piping and evaporator charge added.

## *Table 26, AGZ 045CB through 060CB, Remote Evaporator*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 045C | | 050C | | 055C | | 060C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 42.1 (148.0) | | 47.6 (167.4) | | 51.4 (180.7) | | 55.1 (193.7) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, lbs. | 44 | 44 | 50 | 50 | 52 | 52 | 54 | 54 |
| Unit Operating Charge, R-410A, (kg) | 20.2 | 20.2 | 23 | 23 | 24 | 24 | 25 | 25 |
| Cabinet Dimensions, LxWxH, in. | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100. | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 3360 (1524) | | 3380 (1533) | | 3410 (1547) | | 3430 (1556) | |
| Unit Shipping Weight, Lbs. (kg) | 3260 (1479) | | 3280 (1488) | | 3300 (1497) | | 3320 (1506 | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 476 (216) | | 476 (216) | | 476 (216) | | 568 (258) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 11.5 | 11.5 | 13.0 | 13.0 | 13.0 | 15.0 | 15.0 | 15 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, (oz.) | 110 | 110 | 110 | 110 | 110 | 110 | 110 | 110 |
| Oil Charge Per Compressor, (g) | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 | 3119 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-25-50-75-100 | | 0-23-50-73-100 | | 0-25-50-75-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-25-50-75-100 | | 0-27-50-77-100 | | 0-25-50-75-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area, (sq. ft.) | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 | 44.1 |
| Coil Face Area , (sq. m) | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 |
| Finned Height x Finned Length, (in.) | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 | 42x75.6 |
| Finned Height x Finned Length, (mm) | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 | 1067 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) | 69 (31) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (Note 2) | 4 – 1.5 | | 4 – 1.5 | | 4 – 1.5 | | 4 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 39,600 (18,692) | | 39,600 (18,692) | | 37,228 (17,572 | | 43,452 (20,510) | |
| | | | | | | | | |
| **REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Evaporator Model | ACH130-138DQ | | ACH130-158DQ | | ACH130-178DQ | | ACH250-110DQ | |
| Dry Weight lbs (kg) | 146 (66) | | 165 (75) | | 183 (83) | | 229 (104) | |
| Water Volume, Gallons, (L) | 2.9 (11.0) | | 3.4 (12.8) | | 3.7 (14.0) | | 5.8 (22.1) | |
| Maximum Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Maximum Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Connections, in. (mm) | 2.5 (65) | | 2.5 (65) | | 2.5 (65) | | 3 (80) | |
| Drain - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |

**NOTES**

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60, HP = 2.0
3. Water connection shown is nominal pipe size.
4. Units shipped with a holding charge of nitrogen and helium. Operating charge quantity shown must be charged in the field plus field piping and evaporator charge added.

### *Table 27, AGZ 065CB through 070CB, Remote Evaporator*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | |
|---|---|---|---|---|
| | 065C | | 070C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 57.1 (200.8) | | 62.3 (219.1) | |
| Number Of Refrigerant Circuits | 2 | | 2 | |
| Unit Operating Charge, R-410A, (lbs.) | 58 | 58 | 60 | 60 |
| Unit Operating Charge, R-410A, (kg) | 26 | 26 | 27 | 27 |
| Cabinet Dimensions, LxWxH, (in.) | 94.4 x 88.0 x 100.4 | | 94.4 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 2398 x 2235 x 2550 | | 2398 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 3470 (1574) | | 3700 (1678) | |
| Unit Shipping Weight, Lbs. (kg) | 3350 (1520) | | 3580 (1624) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 568 (258) | | 568 (258) | |
| **COMPRESSORS** | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 15 | 15 | 15/20 | 15/20 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, (oz.) | 110 | 110 | 110/158 | 110/158 |
| Oil Charge Per Compressor, (g) | 3119 | 3119 | 3119/ 4479 | 3119/ 4479 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-21-50-71-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-28-50-78-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | |
| Coil Face Area, sq. ft. | 52.6 | 52.6 | 52.6 | 52.6 |
| Coil Face Area , sq. m | 4.9 | 4.9 | 4.9 | 4.9 |
| Finned Height x Finned Length, in. | 50x75.6 | 50x75.6 | 50x75.6 | 50x75.6 |
| Finned Height x Finned Length, (mm) | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 | 1270 x 1920 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 81 (37) | 81 (37) | 81 (37) | 81 (37) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 4 – 30 (762) | | 4 – 30 (762) | |
| Number Of Motors - HP (kW) (Note 2) | 4 – 2.0 | | 4 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 43,452 (20,510) | | 43,452 (20,510) | |
| | | | | |
| **REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE** | | | | |
| Number of Evaporators | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | |
| Evaporator Model | ACH250-122DQ | | ACH250122DQ | |
| Dry Weight lbs (kg) | 251 (114) | | 251 (114) | |
| Water Volume, Gallons, (L) | 6.4 (24.3) | | 6.4 (24.3) | |
| Maximum Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | |
| Maximum Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Connections, in. (mm) | 3 (80) | | 3 (80) | |
| Drain - NPT int, in. | Field Piping | | Field Piping | |
| Vent - NPT int, in. | Field Piping | | Field Piping | |

**NOTES**

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Except for 380V/60 & 575V/60 for AGZ 060, HP = 2.0
3. Water connection shown is nominal pipe size.
4. Units shipped with a holding charge of nitrogen and helium. Operating charge quantity shown must be charged in the field plus field piping and evaporator charge added.

## *Table 28, AGZ 075CB through 100CB, Remote Evaporator*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 075C | | 080C | | 090C | | 100C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 71.6 (251.7) | | 79.5 (279.5) | | 86.3 (303.4) | | 97.8 (343.9) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, lbs. | 75 | 75 | 80 | 80 | 86 | 86 | 88 | 88 |
| Unit Operating Charge, R-410A, (kg) | 34.3 | 34.3 | 36 | 36 | 39 | 39 | 40 | 40 |
| Cabinet Dimensions, LxWxH, in. | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | | 134.9 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | | 3426 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 5225 (2370) | | 5320 (2413) | | 5390 (2445) | | 5480 (2486) | |
| Unit Shipping Weight, Lbs. (kg) | 5065 (2297) | | 5160 (2341) | | 5220 (2368) | | 5300 (2404) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 870 (395) | | 870 (395) | | 870 (395) | | 870 (395) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | | Tandem Scrolls | |
| Nominal tonnage of each Compressor | 20 | 20 | 20 | 25 | 25 | 25 | 25/30 | 25/30 |
| Number Of Compressors per Circuit | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Oil Charge Per Compressor, oz. | 158 | 158 | 158 | 230 | 230 | 230 | 230/213 | 230/213 |
| Oil Charge Per Compressor, (g) | 4479 | 4479 | 4479 | 6520 | 6520 | 6520 | 6520/ 6038 | 6520/ 6038 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 4 Stages, Circuit #1 in Lead | 0-25-50-75-100 | | 0-22-50-72-100 | | 0-25-50-75-100 | | 0-22-50-72-100 | |
| Staging, 4 Stages, Circuit #2 in Lead | 0-25-50-75-100 | | 0-28-50-78-100 | | 0-25-50-75-100 | | 0-22-50-72-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area, sq. ft. | 66.2 | 66.2 | 66.2 | 66.2 | 78.8 | 78.8 | 78.8 | 78.8 |
| Coil Face Area, ($m^2$) | 6.1 | 6.1 | 6.1 | 6.1 | 7.3 | 7.3 | 7.3 | 7.3 |
| Finned Height x Finned Length, in. | 42 x113.4 | 42 x113.4 | 42 x113.4 | 42 x113.4 | 50 x113.4 | 50 x113.4 | 50 x113.4 | 50 x113.4 |
| Finned Height x Finned Length, (mm) | 1069 x 2880 | 1069 x 2880 | 1069 x 2880 | 1069 x 2880 | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 | 1270 x 2880 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 111 (50) | 111 (50) | 111 (50) | 111 (50) | 130 (59) | 130 (59) | 130 (59) | 130 (59) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 6 – 30 (762) | | 6 – 30 (762) | | 6 – 30 (762) | | 6 – 30 (762) | |
| Number Of Motors - HP (kW) | 6 – 2.0 | | 6 – 2.0 | | 6 – 2.0 | | 6 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 65,178 (30,765) | | 65,178 (30,765) | | 65,178 (30,765) | | 65,178 (30,765) | |
| | | | | | | | | |
| **REMOTE EVAPORATOR – BRAZED PLATE-TO-PLATE** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1, | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Evaporator Model | ACH350-118DQ | | ACH350-126DQ | | ACH350-150DQ | | ACH350-162DQ | |
| Dry Weight lbs (kg) | 243 (110) | | 258 (117) | | 287 (130) | | 324 (147) | |
| Water Volume, Gallons, (L) | 6.4 (24.2) | | 6.6 (24.9) | | 7.5 (28.4) | | 8.0 (30.2) | |
| Max. Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Max. Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet/Outlet Victaulic Conn. in. (mm) | 3 (80) | | 3 (80) | | 3 (80) | | 3 (80) | |
| Drain - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | | Field Piping | |

**NOTE:**
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.
3. Units shipped with a holding charge of nitrogen and helium. Operating charge quantity shown must be charged in the field plus field piping and evaporator charge added.

### *Table 29, AGZ 110CB through 130CB, Remote Evaporator*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | |
|---|---|---|---|---|---|---|
| | 110C | | 125C | | 130C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI Conditions (1), Tons (kW) | 104.2 (366) | | 114.3 (402) | | 124.7 (438) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, lbs. | 102 | 102 | 115 | 115 | 115 | 115 |
| Unit Operating Charge, R-410A, (kg) | 46 | 46 | 52 | 52 | 52 | 52 |
| Cabinet Dimensions, LxWxH, in. | 173.1 x 88.0 x 100.4 | | 173.1 x 88.0 x 100.4 | | 173.1 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 4397 x 2235 x 2550 | | 4397 x 2235 x 2550 | | 4397 x 2235 x 2550 | |
| Unit Operating Weight, Lbs. (kg) | 6035 (2737) | | 6215 (2819) | | 6315 (2864) | |
| Unit Shipping Weight, Lbs. (kg) | 5830 (2644) | | 5995 (2719) | | 6085 (2760) | |
| Add'l Weight If Copper Finned Coils, lbs. (kg) | 1155 (524) | | 1155 (524) | | 1155 (524) | |
| **COMPRESSORS** | | | | | | |
| Type | Trio Scrolls | | Trio Scrolls | | Trio Scrolls | |
| Nominal tonnage of each Compressor | 20.0 | 20.0 | 20.0 | 25.0 | 25.0 | 25.0 |
| Number Of Compressors per Circuit | 3 | 3 | 3 | 3 | 3 | 3 |
| Oil Charge Per Compressor, oz. | 158 | 158 | 158 | 230 | 230 | 230 |
| Oil Charge Per Compressor, (g) | 4479 | 4479 | 4479 | 6520 | 6520 | 6520 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | |
| Staging, 6 Stages, Circuit #1 in Lead | 0-17-33-50-67-83-100 | | 0-15-33-48-67-81-100 | | 0-17-33-50-67-83-100 | |
| Staging, 6 Stages, Circuit #2 in Lead | 0-17-33-50-67-83-100 | | 0-19-33-52-67-86-100 | | 0-17-33-50-67-83-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | |
| Coil Face Area, sq. ft. | 88.4 | 88.4 | 105.3 | 105.3 | 105.3 | 105.3 |
| Coil Face Area, ($m^2$) | 8.2 | 8.2 | 9.8 | 9.8 | 9.8 | 9.8 |
| Finned Height x Finned Length, in. | 42 x151.6 | 42 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 | 50 x151.6 |
| Finned Height x Finned Length, (mm) | 1069 x 3851 | 1069 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 | 1270 x 3851 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 142/64 | 142/64 | 166/75 | 166/75 | 166/75 | 166/75 |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | |
| Number Of Fans - Fan Diameter, in. (mm) | 8 – 30 (762) | | 8 – 30 (762) | | 8 – 30 (762) | |
| Number Of Motors - HP (kW) | 8 – 2.0 | | 8 – 2.0 | | 8 – 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (m/sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 86,904 (41,020) | | 86,904 (41,020) | | 86,904 (41,020) | |
| | | | | | | |
| **REMOTE EVAPORATOR - BRAZED PLATE-TO-PLATE** | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | |
| Evaporator Model | ACH350-162DQ | | ACH350-182DQ | | ACH350-210DQ | |
| Dry Weight lbs (kg) | 324 (147) | | 359 (163) | | 410 (186) | |
| Water Volume, Gallons, (L) | 8.5 (32.1) | | 9.6 (36.3) | | 10.5 (39.7) | |
| Max. Water Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Max. Refrigerant Working Pressure, psig (kPa) | 653 (4502) | | 653 (4502) | | 653 (4502) | |
| Water Inlet / Outlet Victaulic Conn, in. (mm) | 3 (80) | | 3 (80) | | 3 (80) | |
| Drain - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | |
| Vent - NPT int, in. (mm) | Field Piping | | Field Piping | | Field Piping | |

**NOTE:**

1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.
3. Units shipped with a holding charge of nitrogen and helium. Operating charge quantity shown must be charged in the field plus field piping and evaporator charge added.

### *Table 30, AGZ 140CB through 190CB, Remote Evaporator*

| PHYSICAL DATA | AGZ MODEL NUMBER | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 140C | | 160C | | 180C | | 190C | |
| **BASIC DATA** | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.1 | Ckt.1 | Ckt.2 | Ckt.1 | Ckt.2 |
| Unit Capacity @ ARI (1), Tons (kW) | 133.7 (470) | | 151.5 (533) | | 169.3 (595) | | 180.1 (633) | |
| Number Of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Unit Operating Charge, R-410A, Lbs. | 125 | 125 | 130 | 130 | 130 | 130 | 140 | 140 |
| Unit Operating Charge, R-410A, (kg) | 57 | 57 | 59 | 59 | 59 | 59 | 64 | 64 |
| Cabinet Dimensions, LxWxH, In. | 218.6 x 88.0 x 100.4 | | 218.6 x 88.0 x 100.4 | | 218.6 x 88.0 x 100.4 | | 256.9 x 88.0 x 100.4 | |
| Cabinet Dimensions, LxWxH, (mm) | 5552 x 2235 x 2545 | | 5552 x 2235 x 2545 | | 5552 x 2235 x 2545 | | 6525 x 2235 x 2545 | |
| Unit Operating Weight, Lb (kg) | 8380 (3801) | | 8510 (3860) | | 8630 (3915) | | 10170 (4614) | |
| Unit Shipping Weight, Lb (kg) | 8120 (3683) | | 8240 (3738) | | 8350 (3788) | | 9685 (4394) | |
| Add'l Weight If Copper Finned Coils, Lb (kg) | 1596 (724) | | 1596 (724) | | 1596 (724) | | 1915 (869) | |
| **COMPRESSORS** | | | | | | | | |
| Type | Triple Scrolls | | Triple Scrolls | | Triple Scrolls | | Triple Scrolls | |
| Nominal tonnage of each Compressor | 25 | 25 | 25 | 30 | 30 | 30 | 30 | 30 |
| Number Of Compressors per Circuit | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Oil Charge Per Compressor, Oz. | 230 | 230 | 230 | 213 | 213 | 213 | 213 | 213 |
| Oil Charge Per Compressor, (g) | 6520 | 6520 | 6520 | 6038 | 6038 | 6038 | 6038 | 6038 |
| **CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT** | | | | | | | | |
| Staging, 6 Stages, Circuit #1 in Lead | 0-17-33-50-67-83-100 | | 0-15-33-48-67-81-100 | | 0-17-33-50-67-83-100 | | 0-17-33-50-67-83-100 | |
| Staging, 6 Stages, Circuit #2 in Lead | 0-17-33-50-67-83-100 | | 0-19-33-52-67-86-100 | | 0-17-33-50-67-83-100 | | 0-17-33-50-67-83-100 | |
| **CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING** | | | | | | | | |
| Coil Face Area Sq. Ft. | 131.8 | 131.8 | 131.8 | 131.8 | 131.8 | 131.8 | 158.3 | 158.3 |
| Coil Face Area, ($M^2$) | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | 14.7 | 14.7 |
| Finned Height x Finned Length, In. | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 190 | 50 x 228 | 50 x 228 |
| Finned Height x Finned Length, (mm) | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 4821 | 1270 x 5791 | 1270 x 5791 |
| Fins Per Inch x Rows Deep | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 | 16 x 3 |
| Pumpdown Capacity, 90% Full Lbs. (kg) | 202 (92) | 202 (92) | 202 (92) | 202 (92) | 202 (92) | 202 (92) | 242 (110) | 242 (110) |
| **CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE** | | | | | | | | |
| Number Of Fans - Fan Diameter, In. (mm) | 10 – 30 (762) | | 10 – 30 (762) | | 10 – 30 (762) | | 12 – 30 (762) | |
| Number Of Motors - HP (kW) (2) | 104 – 1.5 | | 10 – 1.5 | | 10 – 1.5 | | 12 x 2.0 | |
| Fan And Motor RPM, 60Hz | 1140 | | 1140 | | 1140 | | 1140 | |
| 60 Hz Fan Tip Speed, FPM (M/Sec) | 8950 (45) | | 8950 (45) | | 8950 (45) | | 8950 (45) | |
| 60 Hz Total Unit Airflow, CFM (l/sec) | 108,630 (51,268) | | 108,630 (51,268) | | 108,630 (51,268) | | 130,356 (61,522) | |
| | | | | | | | | |
| **REMOTE EVAPORATOR SHELL-AND-TUBE** | | | | | | | | |
| Number of Evaporators | 1 | | 1 | | 1 | | 1 | |
| Number of Refrigerant Circuits | 2 | | 2 | | 2 | | 2 | |
| Evaporator Model | EV34191111NS/9 | | EV34191111NS/9 | | EV34191111NS/9 | | EV34191212NS/7 | |
| Dry Weight lbs (kg) | 870 (395) | | 870 (395) | | 870 (395) | | 900 (408) | |
| Water Volume, Gallons, (L) | 58 (219) | | 58 (219) | | 58 (219) | | 57 (215) | |
| Maximum Water Pressure, psig (kPa) | 152 (1048) | | 152 (1048) | | 152 (1048) | | 152 (1048) | |
| Max. Refrig. Working Pressure, psig (kPa) | 450 (3103) | | 450 (3103) | | 450 (3103) | | 450 (3103) | |
| Water Inlet / Outlet Victaulic Conn. In. (mm) | 8.0 (200) | | 8.0 (200) | | 8.0 (200) | | 8.0 (200) | |
| Drain - NPT int, In. | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | |
| Vent - NPT int, In. | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | | ½-in. NPTF | |

**NOTE:**
1. Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
2. Water connection shown is nominal pipe size.
3. Units shipped with a holding charge of nitrogen and helium. Operating charge quantity shown must be charged in the field plus field piping and evaporator charge added.

# Electrical Data

## Compressor and Fan Amps

***Table 31, Compressor and Fan Amps***

| AGZ UNIT SIZE | VOLTS | RATED LOAD AMPS | | | | | | LOCK ROTOR AMPS | | | | | | FAN MOTORS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CIRCUIT #1 | | | CIRCUIT #2 | | | CIRCUIT #1 | | | CIRCUIT #2 | | | NO. | FLA (EA) | LRA (EA |
| | | #1 | #3 | #5 | #2 | #4 | #6 | #1 | #3 | #5 | #2 | #4 | #6 | | | |
| 030 | 208 | 31.6 | 31.6 | -- | 31.6 | 31.6 | -- | 225 | 225 | -- | 225 | 225 | -- | 4 | 5.8 | 23.3 |
| | 230 | 30.1 | 30.1 | -- | 30.1 | 30.1 | -- | 225 | 225 | -- | 225 | 225 | -- | 4 | 5.8 | 26.1 |
| | 460 | 16.7 | 16.7 | -- | 16.7 | 16.7 | -- | 114 | 114 | -- | 114 | 114 | -- | 4 | 2.8 | 13.0 |
| | 575 | 13.0 | 13.0 | -- | 13.0 | 13.0 | -- | 80 | 80 | -- | 80 | 80 | -- | 4 | 3.0 | 14.0 |
| 035 | 208 | 31.6 | 31.6 | -- | 36.3 | 36.3 | -- | 225 | 225 | -- | 239 | 239 | -- | 4 | 5.8 | 23.3 |
| | 230 | 30.1 | 30.1 | -- | 36.0 | 36.0 | -- | 225 | 225 | -- | 239 | 239 | -- | 4 | 5.8 | 26.1 |
| | 460 | 16.7 | 16.7 | -- | 17.9 | 17.9 | -- | 114 | 114 | -- | 125 | 125 | -- | 4 | 2.8 | 13.0 |
| | 575 | 13.0 | 13.0 | -- | 13.0 | 13.0 | -- | 80 | 80 | -- | 80 | 80 | -- | 4 | 3.0 | 14.0 |
| 040 | 208 | 36.3 | 36.3 | -- | 36.3 | 36.3 | -- | 239 | 239 | -- | 239 | 239 | -- | 4 | 5.8 | 23.3 |
| | 230 | 36.0 | 36.0 | -- | 36.0 | 36.0 | -- | 239 | 239 | -- | 239 | 239 | -- | 4 | 5.8 | 26.1 |
| | 460 | 17.9 | 17.9 | -- | 17.9 | 17.9 | -- | 125 | 125 | -- | 125 | 125 | -- | 4 | 2.8 | 13.0 |
| | 575 | 13.0 | 13.0 | -- | 13.0 | 13.0 | -- | 80 | 80 | -- | 80 | 80 | -- | 4 | 3.0 | 14.0 |
| 045 | 208 | 48.1 | 48.1 | -- | 48.1 | 48.1 | -- | 245 | 245 | -- | 245 | 245 | -- | 4 | 5.8 | 23.3 |
| | 230 | 48.1 | 48.1 | -- | 48.1 | 48.1 | -- | 245 | 245 | -- | 245 | 245 | -- | 4 | 5.8 | 26.1 |
| | 460 | 18.9 | 18.9 | -- | 18.9 | 18.9 | -- | 125 | 125 | -- | 125 | 125 | -- | 4 | 2.8 | 13.0 |
| | 575 | 15.1 | 15.1 | -- | 15.1 | 15.1 | -- | 100 | 100 | -- | 100 | 100 | -- | 4 | 3.0 | 14.0 |
| 050 | 208 | 52.8 | 52.8 | -- | 52.8 | 52.8 | -- | 300 | 300 | -- | 300 | 300 | -- | 4 | 5.8 | 23.3 |
| | 230 | 52.8 | 52.8 | -- | 52.8 | 52.8 | -- | 300 | 300 | -- | 300 | 300 | -- | 4 | 5.8 | 26.1 |
| | 460 | 23.1 | 23.1 | -- | 23.1 | 23.1 | -- | 150 | 150 | -- | 150 | 150 | -- | 4 | 2.8 | 13.0 |
| | 575 | 19.9 | 19.9 | -- | 19.9 | 19.9 | -- | 109 | 109 | -- | 109 | 109 | -- | 4 | 3.0 | 14.0 |
| 055 | 208 | 52.8 | 52.8 | -- | 56.6 | 56.6 | -- | 300 | 300 | -- | 340 | 340 | -- | 4 | 5.8 | 23.3 |
| | 230 | 52.8 | 52.8 | -- | 55.8 | 55.8 | -- | 300 | 300 | -- | 340 | 340 | -- | 4 | 5.8 | 26.1 |
| | 460 | 23.1 | 23.1 | -- | 26.9 | 26.9 | -- | 150 | 150 | -- | 172 | 172 | -- | 4 | 2.8 | 13.0 |
| | 575 | 19.9 | 19.9 | -- | 23.7 | 23.7 | -- | 109 | 109 | -- | 132 | 132 | -- | 4 | 3.0 | 14.0 |
| 060 | 208 | 56.6 | 56.6 | -- | 56.6 | 56.6 | -- | 340 | 340 | -- | 340 | 340 | -- | 4 | 5.8 | 23.3 |
| | 230 | 55.8 | 55.8 | -- | 55.8 | 55.8 | -- | 340 | 340 | -- | 340 | 340 | -- | 4 | 5.8 | 26.1 |
| | 460 | 26.9 | 26.9 | -- | 26.9 | 26.9 | -- | 172 | 172 | -- | 172 | 172 | -- | 4 | 2.8 | 13.0 |
| | 575 | 23.7 | 23.7 | -- | 23.7 | 23.7 | -- | 132 | 132 | -- | 132 | 132 | -- | 4 | 3.0 | 14.0 |
| 065 | 208 | 56.6 | 56.6 | -- | 56.6 | 56.6 | -- | 340 | 340 | -- | 340 | 340 | -- | 4 | 7.8 | 31.7 |
| | 230 | 55.8 | 55.8 | -- | 55.8 | 55.8 | -- | 340 | 340 | -- | 340 | 340 | -- | 4 | 7.8 | 35.6 |
| | 460 | 26.9 | 26.9 | -- | 26.9 | 26.9 | -- | 172 | 172 | -- | 172 | 172 | -- | 4 | 3.6 | 17.8 |
| | 575 | 23.7 | 23.7 | -- | 23.7 | 23.7 | -- | 132 | 132 | -- | 132 | 132 | -- | 4 | 3.0 | 14.0 |
| 070 | 208 | 56.6 | 74.5 | -- | 56.6 | 74.5 | -- | 340 | 505 | -- | 340 | 505 | -- | 4 | 7.8 | 31.7 |
| | 230 | 55.8 | 74.5 | -- | 55.8 | 74.5 | -- | 340 | 505 | -- | 340 | 505 | -- | 4 | 7.8 | 35.6 |
| | 460 | 26.9 | 33.0 | -- | 26.9 | 33.0 | -- | 172 | 225 | -- | 172 | 225 | -- | 4 | 3.6 | 17.8 |
| | 575 | 23.7 | 25.2 | -- | 23.7 | 25.2 | -- | 132 | 180 | -- | 132 | 180 | -- | 4 | 3.0 | 14.0 |
| 075 | 208 | 74.5 | 74.5 | -- | 74.5 | 74.5 | -- | 505 | 505 | -- | 505 | 505 | -- | 6 | 7.8 | 31.7 |
| | 230 | 74.5 | 74.5 | -- | 74.5 | 74.5 | -- | 505 | 505 | -- | 505 | 505 | -- | 6 | 7.8 | 35.6 |
| | 460 | 33.0 | 33.0 | -- | 33.0 | 33.0 | -- | 225 | 225 | -- | 225 | 225 | -- | 6 | 3.6 | 17.8 |
| | 575 | 25.2 | 25.2 | -- | 25.2 | 25.2 | -- | 180 | 180 | -- | 180 | 180 | -- | 6 | 3.0 | 14.0 |
| 080 | 208 | 74.5 | 74.5 | -- | 89.1 | 89.1 | -- | 505 | 505 | -- | 544 | 544 | -- | 6 | 7.8 | 31.7 |
| | 230 | 74.5 | 74.5 | -- | 89.1 | 89.1 | -- | 505 | 505 | -- | 544 | 544 | -- | 6 | 7.8 | 35.6 |
| | 460 | 33.0 | 33.0 | -- | 44.5 | 44.5 | -- | 225 | 225 | -- | 272 | 272 | -- | 6 | 3.6 | 17.8 |
| | 575 | 25.2 | 25.2 | -- | 32.1 | 32.1 | -- | 180 | 180 | -- | 218 | 218 | -- | 6 | 3.0 | 14.0 |

See notes on page 62
Continued on next page

### *Table 31, Compressor and Fan Amps*

| AGZ UNIT SIZE | VOLTS | RATED LOAD AMPS | | | | | | LOCK ROTOR AMPS | | | | | | FAN MOTORS | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CIRCUIT #1 | | | CIRCUIT #2 | | | CIRCUIT #1 | | | CIRCUIT #2 | | | | | |
| | | #1 | #3 | #5 | #2 | #4 | #6 | #1 | #3 | #5 | #2 | #4 | #6 | NO. | FLA (EA) | LRA (EA |
| 090 | 208 | 89.1 | 89.1 | -- | 89.1 | 89.1 | -- | 544 | 544 | -- | 544 | 544 | -- | 6 | 7.8 | 31.7 |
| | 230 | 89.1 | 89.1 | -- | 89.1 | 89.1 | -- | 544 | 544 | -- | 544 | 544 | -- | 6 | 7.8 | 35.6 |
| | 460 | 44.5 | 44.5 | -- | 44.5 | 44.5 | -- | 272 | 272 | -- | 272 | 272 | -- | 6 | 3.6 | 17.8 |
| | 575 | 32.1 | 32.1 | -- | 32.1 | 32.1 | -- | 218 | 218 | -- | 218 | 218 | -- | 6 | 3.0 | 14.0 |
| 100 | 208 | 89.1 | 115.5 | -- | 89.1 | 115.5 | -- | 544 | 599 | -- | 544 | 599 | -- | 6 | 7.8 | 31.7 |
| | 230 | 89.1 | 115.5 | -- | 89.1 | 115.5 | -- | 544 | 599 | -- | 544 | 599 | -- | 6 | 7.8 | 35.6 |
| | 460 | 43.0 | 54.5 | -- | 43.0 | 54.5 | -- | 272 | 310 | -- | 272 | 310 | -- | 6 | 3.6 | 17.8 |
| | 575 | 32.1 | 44.5 | -- | 32.1 | 44.5 | -- | 218 | 239 | -- | 218 | 239 | -- | 6 | 3.0 | 14.0 |
| 110 | 208 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 505 | 505 | 505 | 505 | 505 | 505 | 8 | 7.8 | 31.7 |
| | 230 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 74.5 | 505 | 505 | 505 | 505 | 505 | 505 | 8 | 7.8 | 35.6 |
| | 460 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 30.6 | 225 | 225 | 225 | 225 | 225 | 225 | 8 | 3.6 | 17.8 |
| | 575 | 25.2 | 25.2 | 25.2 | 25.2 | 25.2 | 25.2 | 180 | 180 | 180 | 180 | 180 | 180 | 8 | 3.0 | 14.0 |
| 125 | 208 | 86.3 | 86.3 | 86.3 | 89.1 | 89.1 | 89.1 | 505 | 505 | 505 | 544 | 544 | 544 | 8 | 7.8 | 31.7 |
| | 230 | 86.3 | 86.3 | 86.3 | 89.1 | 89.1 | 89.1 | 505 | 505 | 505 | 544 | 544 | 544 | 8 | 7.8 | 35.6 |
| | 460 | 30.6 | 30.6 | 30.6 | 44.5 | 44.5 | 44.5 | 225 | 225 | 225 | 272 | 272 | 272 | 8 | 3.6 | 17.8 |
| | 575 | 25.2 | 25.2 | 25.2 | 32.1 | 32.1 | 32.1 | 180 | 180 | 180 | 218 | 218 | 218 | 8 | 3.0 | 14.0 |
| 130 | 208 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 544 | 544 | 544 | 544 | 544 | 544 | 8 | 7.8 | 31.7 |
| | 230 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 544 | 544 | 544 | 544 | 544 | 544 | 8 | 7.8 | 35.6 |
| | 460 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 272 | 272 | 272 | 272 | 272 | 272 | 8 | 3.6 | 17.8 |
| | 575 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 218 | 218 | 218 | 218 | 218 | 218 | 8 | 3.0 | 14.0 |
| 140 | 208 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 544 | 544 | 544 | 544 | 544 | 544 | 10 | 7.8 | 31.7 |
| | 230 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 89.1 | 544 | 544 | 544 | 544 | 544 | 544 | 10 | 7.8 | 35.6 |
| | 460 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 272 | 272 | 272 | 272 | 272 | 272 | 10 | 3.6 | 17.8 |
| | 575 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 32.1 | 218 | 218 | 218 | 218 | 218 | 218 | 10 | 3.0 | 14.0 |
| 160 | 208 | 89.1 | 89.1 | 89.1 | 115.5 | 115.5 | 115.5 | 544 | 544 | 544 | 599 | 599 | 599 | 10 | 7.8 | 31.7 |
| | 230 | 89.1 | 89.1 | 89.1 | 115.5 | 115.5 | 115.5 | 544 | 544 | 544 | 599 | 599 | 599 | 10 | 7.8 | 35.6 |
| | 460 | 44.5 | 44.5 | 44.5 | 54.5 | 54.5 | 54.5 | 272 | 272 | 272 | 310 | 310 | 310 | 10 | 3.6 | 17.8 |
| | 575 | 32.1 | 32.1 | 32.1 | 44.5 | 44.5 | 44.5 | 218 | 218 | 218 | 239 | 239 | 239 | 10 | 3.0 | 14.0 |
| 180 | 208 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 599 | 599 | 599 | 599 | 599 | 599 | 10 | 7.8 | 31.7 |
| | 230 | 115.5 | 115.5 | 115.5 | 115.5 | 115.5 | 115.5 | 599 | 599 | 599 | 599 | 599 | 599 | 10 | 7.8 | 35.6 |
| | 460 | 57.2 | 57.2 | 57.2 | 57.2 | 57.2 | 57.2 | 310 | 310 | 310 | 310 | 310 | 310 | 10 | 3.6 | 17.8 |
| | 575 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 239 | 239 | 239 | 239 | 239 | 239 | 10 | 3.0 | 14.0 |
| 190 | 208 | 127.5 | 127. | 127.5 | 127.5 | 127.5 | 127.5 | 599 | 599 | 599 | 599 | 599 | 599 | 12 | 7.8 | 31.7 |
| | 230 | 115.5 | 115. | 115.5 | 115.5 | 115.5 | 115.5 | 599 | 599 | 599 | 599 | 599 | 599 | 12 | 7.8 | 35.6 |
| | 460 | 57.2 | 57.2 | 57.2 | 57.2 | 57.2 | 57.2 | 310 | 310 | 310 | 310 | 310 | 310 | 12 | 3.6 | 17.8 |
| | 575 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 44.5 | 239 | 239 | 239 | 239 | 239 | 239 | 12 | 3.0 | 14.0 |

See notes on page 62

# Electric Data, Single Point

***Table 32, Electric Data, Single Point***

| AGZ UNIT SIZE | VOLTS | PUMP MOTOR HP | MIN. CIRCUIT AMPACITY (MCA) | POWER SUPPLY | | | | FIELD FUSE OR. CKT. BREAKER SIZE | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | FIELD WIRE | | FIELD SUPPLIED HUB (IN.) | | | |
| | | | | QTY | WIRE GA | QTY | NOM. SIZE | RECOM. | MAX. |
| 030 | 208 | None | 158 | 3 | 2/0 AWG | 1 | 1.50 | 175 | 175 |
| | 230 | None | 152 | 3 | 2/0 AWG | 1 | 1.50 | 175 | 175 |
| | 460 | None | 83 | 3 | 4 AWG | 1 | 1.00 | 90 | 90 |
| | 575 | None | 68 | 3 | 4 AWG | 1 | 1.00 | 80 | 80 |
| 035 | 208 | None | 169 | 3 | 2/0 AWG | 1 | 1.50 | 200 | 200 |
| | 230 | None | 165 | 3 | 2/0 AWG | 1 | 1.50 | 200 | 200 |
| | 460 | None | 85 | 3 | 4 AWG | 1 | 1.00 | 100 | 100 |
| | 575 | None | 68 | 3 | 4 AWG | 1 | 1.00 | 80 | 80 |
| 040 | 208 | None | 178 | 3 | 3/0 AWG | 1 | 2.00 | 200 | 200 |
| | 230 | None | 177 | 3 | 3/0 AWG | 1 | 2.00 | 200 | 200 |
| | 460 | None | 88 | 3 | 3 AWG | 1 | 1.00 | 100 | 100 |
| | 575 | None | 68 | 3 | 4 AWG | 1 | 1.00 | 80 | 80 |
| 045 | 208 | None | 228 | 3 | 4/0 AWG | 1 | 2.00 | 250 | 250 |
| | 230 | None | 228 | 3 | 4/0 AWG | 1 | 2.00 | 250 | 250 |
| | 460 | None | 92 | 3 | 3 AWG | 1 | 1.00 | 110 | 110 |
| | 575 | None | 77 | 3 | 4 AWG | 1 | 1.00 | 90 | 90 |
| 050 | 208 | None | 248 | 3 | 250 MCM | 1 | 2.00 | 300 | 300 |
| | 230 | None | 248 | 3 | 250 MCM | 1 | 2.00 | 300 | 300 |
| | 460 | None | 110 | 3 | 2 AWG | 1 | 1.25 | 125 | 125 |
| | 575 | None | 97 | 3 | 3 AWG | 1 | 1.00 | 110 | 110 |
| 055 | 208 | None | 257 | 3 | 300 MCM | 1 | 2.50 | 300 | 300 |
| | 230 | None | 255 | 3 | 250 MCM | 1 | 2.50 | 300 | 300 |
| | 460 | None | 118 | 3 | 1 AWG | 1 | 1.25 | 125 | 125 |
| | 575 | None | 106 | 3 | 2 AWG | 1 | 1.25 | 125 | 125 |
| 060 | 208 | None | 264 | 3 | 300 MCM | 1 | 2.50 | 300 | 300 |
| | 230 | None | 261 | 3 | 300 MCM | 1 | 2.50 | 300 | 300 |
| | 460 | None | 126 | 3 | 1 AWG | 1 | 1.25 | 150 | 150 |
| | 575 | None | 113 | 3 | 2 AWG | 1 | 1.25 | 125 | 125 |
| 065 | 208 | None | 272 | 3 | 300 MCM | 1 | 2.50 | 300 | 300 |
| | 230 | None | 269 | 3 | 300 MCM | 1 | 2.50 | 300 | 300 |
| | 460 | None | 129 | 3 | 1 AWG | 1 | 1.25 | 150 | 150 |
| | 575 | None | 113 | 3 | 2 AWG | 1 | 1.25 | 125 | 125 |
| 070 | 208 | None | 313 | 3 | 400 MCM | 1 | 2.50 | 350 | 350 |
| | 230 | None | 311 | 3 | 400 MCM | 1 | 2.50 | 350 | 350 |
| | 460 | None | 143 | 3 | 1/0 AWG | 1 | 1.50 | 175 | 175 |
| | 575 | None | 117 | 3 | 1 AWG | 1 | 1.25 | 125 | 125 |
| 075 | 208 | None | 364 | 6 | 4/0 AWG | 1 | 3.00 | 400 | 400 |
| | 230 | None | 364 | 6 | 4/0 AWG | 1 | 3.00 | 400 | 400 |
| | 460 | None | 162 | 3 | 2/0 AWG | 1 | 1.50 | 175 | 175 |
| | 575 | None | 126 | 3 | 1 AWG | 1 | 1.25 | 150 | 150 |
| 080 | 208 | None | 397 | 6 | 250 MCM | 1 | 3.00 | 450 | 450 |
| | 230 | None | 397 | 6 | 250 MCM | 1 | 3.00 | 450 | 450 |
| | 460 | None | 188 | 3 | 3/0 AWG | 1 | 2.00 | 225 | 225 |
| | 575 | None | 141 | 3 | 1/0 AWG | 1 | 1.50 | 150 | 150 |

**NOTE:** Units in the shaded areas require larger wire to match the High SCCR lug range

See notes on page 62
Continued on next page

### *Table 32, Electric Data, Single Point, Continued*

| AGZ UNIT SIZE | VOLTS | PUMP MOTOR HP | MIN. CIRCUIT AMPACITY (MCA) | POWER SUPPLY | | | | FIELD FUSE OR. CKT. BREAKER SIZE | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | FIELD WIRE | | FIELD SUPPLIED HUB (IN.) | | | |
| | | | | QTY | WIRE GA | QTY | NOM. SIZE | RECOM. | MAX. |
| **090** | 208 | None | 426 | 6 | 300 MCM | 1 | 3.50 | 500 | 500 |
| | 230 | None | 426 | 6 | 300 MCM | 1 | 3.50 | 500 | 500 |
| | 460 | None | 211 | 3 | 4/0 AWG | 1 | 2.00 | 250 | 250 |
| | 575 | None | 155 | 3 | 2/0 AWG | 1 | 1.50 | 175 | 175 |
| **100** | 208 | None | 485 | 6 | 350 MCM | 1 | 3.50 | 600 | 600 |
| | 230 | None | 485 | 6 | 350 MCM | 1 | 3.50 | 600 | 600 |
| | 460 | None | 230 | 3 | 4/0 AWG | 1 | 2.00 | 250 | 250 |
| | 575 | None | 183 | 3 | 3/0 AWG | 1 | 2.00 | 225 | 225 |
| **110** | 208 | None | 529 | 6 | 300 MCM | 2 | 2.50 | 600 | 600 |
| | 230 | None | 529 | 6 | 300 MCM | 2 | 2.50 | 600 | 600 |
| | 460 | None | 221 | 3 | 4/0 AWG | 1 | 2.00 | 250 | 250 |
| | 575 | None | 182 | 3 | 3/0 AWG | 1 | 2.00 | 200 | 200 |
| **125** | 208 | None | 611 | 6 | 350 MCM | 2 | 2.50 | 700 | 700 |
| | 230 | None | 611 | 6 | 350 MCM | 2 | 2.50 | 700 | 700 |
| | 460 | None | 266 | 3 | 300 MCM | 1 | 2.50 | 300 | 300 |
| | 575 | None | 204 | 3 | 4/0 AWG | 1 | 2.00 | 225 | 225 |
| **130** | 208 | None | 620 | 6 | 350 MCM | 2 | 2.50 | 700 | 700 |
| | 230 | None | 620 | 6 | 350 MCM | 2 | 2.50 | 700 | 700 |
| | 460 | None | 307 | 3 | 350 MCM | 1 | 2.50 | 350 | 350 |
| | 575 | None | 225 | 3 | 4/0 AWG | 1 | 2.00 | 250 | 250 |
| **140** | 208 | None | 635 | 6 | 400 MCM | 2 | 2.50 | 700 | 700 |
| | 230 | None | 635 | 6 | 400 MCM | 2 | 2.50 | 700 | 700 |
| | 460 | None | 315 | 3 | 400 MCM | 1 | 2.50 | 350 | 350 |
| | 575 | None | 231 | 3 | 250 MCM | 1 | 2.00 | 250 | 250 |
| **160** | 208 | None | 721 | 12 | 250 MCM | 2 | 3.00 | 800 | 800 |
| | 230 | None | 721 | 12 | 250 MCM | 2 | 3.00 | 800 | 800 |
| | 460 | None | 347 | 6 | 4/0 AWG | 1 | 3.00 | 400 | 400 |
| | 575 | None | 271 | 3 | 300 MCM | 1 | 2.50 | 300 | 300 |
| **180** | 208 | None | 875 | 12 | 300 MCM | 2 | 3.50 | 1000 | 1000 |
| | 230 | None | 800 | 12 | 250 MCM | 2 | 3.00 | 800 | 800 |
| | 460 | None | 394 | 6 | 250 MCM | 1 | 3.00 | 450 | 450 |
| | 575 | None | 309 | 3 | 350 MCM | 1 | 2.50 | 350 | 350 |
| **190** | 208 | None | 891 | 12 | 300 MCM | 2 | 3.50 | 1000 | 1000 |
| | 230 | None | 816 | 12 | 250 MCM | 2 | 3.50 | 800 | 800 |
| | 460 | None | 401 | 6 | 4/0 AWG | 2 | 2.00 | 450 | 450 |
| | 575 | None | 315 | 3 | 400 MCM | 1 | 2.50 | 350 | 350 |

See notes on page 62

# Wiring Data, Single Point

***Table 33, Wiring Data, Single Point***

| AGZ UNIT SIZE | VOLTS | POWER BLOCK | | HIGH SCCR CIRCUIT BREAKER | | DISCONNECT SWITCH | |
|---|---|---|---|---|---|---|---|
| | | SIZE | LUG RANGE | SIZE | LUG RANGE | SIZE | LUG RANGE |
| 030 | 208 | 175 | (1) 2/0 - #14 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 230 | 175 | (1) 2/0 - #14 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 100 | (1) 1/0 - #10 |
| | 575 | 175 | (1) 2/0 - #14 | 150 | (1) 350 - #4 | 100 | (1) 1/0 - #10 |
| 035 | 208 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 230 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 100 | (1) 1/0 - #10 |
| | 575 | 175 | (1) 2/0 - #14 | 150 | (1) 350 - #4 | 100 | (1) 1/0 - #10 |
| 040 | 208 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 230 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 125 | (1) 3/0- #3 |
| | 575 | 175 | (1) 2/0 - #14 | 150 | (1) 350 - #4 | 100 | (1) 1/0 - #10 |
| 045 | 208 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 230 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 125 | (1) 3/0- #3 |
| | 575 | 175 | (1) 2/0 - #14 | 150 | (1) 350 - #4 | 100 | (1) 1/0 - #10 |
| 050 | 208 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 230 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 125 | (1) 3/0- #3 |
| | 575 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 125 | (1) 3/0- #3 |
| 055 | 208 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 230 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | 575 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 125 | (1) 3/0- #3 |
| 060 | 208 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 230 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | 575 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| 065 | 208 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 230 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | 575 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| 070 | 208 | 760 | (2) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 230 | 760 | (2) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 460 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | 575 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| 075 | 208 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 230 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 460 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 575 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| 080 | 208 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 230 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 460 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 575 | 175 | (1) 2/0 - #14 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |

See notes on page 62
Continued on next page

***Table 33, Wiring Data, Single Point, Continued***

| AGZ UNIT SIZE | VOLTS | POWER BLOCK | | HIGH SCCR CIRCUIT BREAKER | | DISCONNECT SWITCH | |
|---|---|---|---|---|---|---|---|
| | | SIZE | LUG RANGE | SIZE | LUG RANGE | SIZE | LUG RANGE |
| 090 | 208 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 230 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 460 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | 575 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| 100 | 208 | 760 | (2) 500 - #4 | Not Available | | 600 | (2) 500- 3/0 |
| | 230 | 760 | (2) 500 - #4 | Not Available | | 600 | (2) 500- 3/0 |
| | 460 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| 110 | 208 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 230 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 460 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| 125 | 208 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 230 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 460 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| 130 | 208 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 230 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 460 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| 140 | 208 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 230 | 760 | (2) 500 - #4 | Not Available | | 800 | (4) 500- 250 |
| | 460 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| 160 | 208 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 230 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 460 | 760 | (2) 500 - #4 | 600 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| 180 | 208 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 230 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 460 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| 180 | 208 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 230 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 460 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| 190 | 208 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 230 | 1000 | (4) 500- 250 | Not Available | | 1000 | (4) 500- 250 |
| | 460 | 760 | (2) 500 - #4 | 800 | (4) 500- 250 | 600 | (2) 500- 3/0 |
| | 575 | 380 | (1) 500 - #4 | 600 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |

See notes on page 62

# Electrical Data, Multi-Point

***Table 34, Electrical Data, Multi-Point***

| AGZ UNIT SIZE | CIR-CUIT | VOLTS | HZ | MIN. CIRCUIT AMPACITY (MCA) | POWER SUPPLY | | | | FIELD FUSE OR. CKT. BREAKER SIZE | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FIELD WIRE | | FIELD SUPPLIED HUB (IN.) | | | |
| | | | | | QTY | WIRE GA | QTY | NOM. SIZE | RECOM. | MAX. |
| 030 | 1 | 208 | 60 | 83 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | | 230 | | 80 | 3 | 3 AWG | 1 | 1.0 | 100 | 100 |
| | | 460 | | 44 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 36 | 3 | 8 AWG | 1 | 0.5 | 45 | 45 |
| | 2 | 208 | 60 | 83 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | | 230 | | 80 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | | 460 | | 44 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 36 | 3 | 8 AWG | 1 | 0.5 | 45 | 45 |
| 035 | 1 | 208 | 60 | 83 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | | 230 | | 80 | 3 | 3 AWG | 1 | 1.0 | 100 | 100 |
| | | 460 | | 44 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 36 | 3 | 8 AWG | 1 | 0.5 | 45 | 45 |
| | 2 | 208 | 60 | 94 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| | | 230 | | 93 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| | | 460 | | 46 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 36 | 3 | 8 AWG | 1 | 0.5 | 45 | 45 |
| 040 | 1 | 208 | 60 | 94 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| | | 230 | | 93 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| | | 460 | | 46 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 36 | 3 | 8 AWG | 1 | 0.5 | 45 | 45 |
| | 2 | 208 | 60 | 94 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| | | 230 | | 93 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| | | 460 | | 46 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 36 | 3 | 8 AWG | 1 | 0.5 | 45 | 45 |
| 045 | 1 | 208 | 60 | 120 | 3 | 1 AWG | 1 | 1.3 | 150 | 150 |
| | | 230 | | 120 | 3 | 1 AWG | 1 | 1.3 | 150 | 150 |
| | | 460 | | 49 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 40 | 3 | 8 AWG | 1 | 0.5 | 50 | 50 |
| | 2 | 208 | 60 | 120 | 3 | 1 AWG | 1 | 1.3 | 150 | 150 |
| | | 230 | | 120 | 3 | 1 AWG | 1 | 1.3 | 150 | 150 |
| | | 460 | | 49 | 3 | 8 AWG | 1 | 0.5 | 60 | 60 |
| | | 575 | | 40 | 3 | 8 AWG | 1 | 0.5 | 50 | 50 |
| 050 | 1 | 208 | 60 | 131 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 230 | | 131 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 58 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| | | 575 | | 51 | 3 | 6 AWG | 1 | 0.8 | 70 | 70 |
| | 2 | 208 | 60 | 131 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 230 | | 131 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 58 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| | | 575 | | 51 | 3 | 6 AWG | 1 | 0.8 | 70 | 70 |

See page 62 for notes.

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## Table 34, *Electrical Data, Multi-Point, Continued*

| AGZ UNIT SIZE | CIR-CUIT | VOLTS | HZ | MIN. CIRCUIT AMPACITY (MCA) | POWER SUPPLY | | | | FIELD FUSE OR. CKT. BREAKER SIZE | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FIELD WIRE | | HUB, FIELD SUPPLIED (IN.) | | | |
| | | | | | QTY | WIRE GA | QTY | NOM. SIZE | RECOM. | MAX. |
| 055 | 1 | 208 | 60 | 131 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 230 | | 131 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 58 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| | | 575 | | 51 | 3 | 6 AWG | 1 | 0.8 | 70 | 70 |
| | 2 | 208 | 60 | 139 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 230 | | 138 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 67 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |
| | | 575 | | 60 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| 060 | 1 | 208 | 60 | 139 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 230 | | 138 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 67 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |
| | | 575 | | 60 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| | 2 | 208 | 60 | 139 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 230 | | 138 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 67 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |
| | | 575 | | 60 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| 065 | 1 | 208 | 60 | 143 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 230 | | 142 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 68 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |
| | | 575 | | 60 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| | 2 | 208 | 60 | 143 | 3 | 1/0 AWG | 1 | 1.5 | 200 | 200 |
| | | 230 | | 142 | 3 | 1/0 AWG | 1 | 1.5 | 175 | 175 |
| | | 460 | | 68 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |
| | | 575 | | 60 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| 070 | 1 | 208 | 60 | 166 | 3 | 2/0 AWG | 1 | 1.5 | 225 | 225 |
| | | 230 | | 165 | 3 | 2/0 AWG | 1 | 1.5 | 225 | 225 |
| | | 460 | | 76 | 3 | 4 AWG | 1 | 1.0 | 100 | 100 |
| | | 575 | | 62 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| | 2 | 208 | 60 | 166 | 3 | 2/0 AWG | 1 | 1.5 | 225 | 225 |
| | | 230 | | 165 | 3 | 2/0 AWG | 1 | 1.5 | 225 | 225 |
| | | 460 | | 76 | 3 | 4 AWG | 1 | 1.0 | 100 | 100 |
| | | 575 | | 62 | 3 | 6 AWG | 1 | 0.8 | 80 | 80 |
| 075 | 1 | 208 | 60 | 192 | 3 | 3/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 230 | | 192 | 3 | 3/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 460 | | 86 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | | 575 | | 66 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |
| | 2 | 208 | 60 | 192 | 3 | 3/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 230 | | 192 | 3 | 3/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 460 | | 86 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | | 575 | | 66 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |

See page 62 for notes.

Continued next page.

## Table 34, *Electrical Data, Multi-Point, Continued*

| AGZ UNIT SIZE | CIR-CUIT | VOLTS | HZ | MIN. CIRCUIT AMPACITY (MCA) | POWER SUPPLY | | | | FIELD FUSE OR. CKT. BREAKER SIZE | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FIELD WIRE | | HUB, FIELD SUPPLIED (IN.) | | | |
| | | | | | QTY | WIRE GA | QTY | NOM. SIZE | RECOM. | MAX. |
| 080 | 1 | 208 | 60 | 192 | 3 | 3/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 230 | | 192 | 3 | 3/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 460 | | 86 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | | 575 | | 66 | 3 | 4 AWG | 1 | 1.0 | 90 | 90 |
| | 2 | 208 | 60 | 224 | 3 | 4/0 AWG | 1 | 2.0 | 300 | 300 |
| | | 230 | | 224 | 3 | 4/0 AWG | 1 | 2.0 | 300 | 300 |
| | | 460 | | 111 | 3 | 2 AWG | 1 | 1.3 | 150 | 150 |
| | | 575 | | 82 | 3 | 4 AWG | 1 | 1.0 | 110 | 110 |
| 090 | 1 | 208 | 60 | 224 | 3 | 4/0 AWG | 1 | 2.0 | 300 | 300 |
| | | 230 | | 224 | 3 | 4/0 AWG | 1 | 2.0 | 300 | 300 |
| | | 460 | | 111 | 3 | 2 AWG | 1 | 1.3 | 150 | 150 |
| | | 575 | | 82 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | 2 | 208 | 60 | 224 | 3 | 4/0 AWG | 1 | 2.0 | 300 | 300 |
| | | 230 | | 224 | 3 | 4/0 AWG | 1 | 2.0 | 300 | 300 |
| | | 460 | | 111 | 3 | 2 AWG | 1 | 1.3 | 150 | 150 |
| | | 575 | | 82 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| 100 | 1 | 208 | 60 | 257 | 3 | 300 MCM | 1 | 2.5 | 350 | 350 |
| | | 230 | | 257 | 3 | 300 MCM | 1 | 2.5 | 350 | 350 |
| | | 460 | | 122 | 3 | 1 AWG | 1 | 1.3 | 175 | 175 |
| | | 575 | | 97 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| | 2 | 208 | 60 | 257 | 3 | 300 MCM | 1 | 2.5 | 350 | 350 |
| | | 230 | | 257 | 3 | 300 MCM | 1 | 2.5 | 350 | 350 |
| | | 460 | | 122 | 3 | 1 AWG | 1 | 1.3 | 175 | 175 |
| | | 575 | | 97 | 3 | 3 AWG | 1 | 1.0 | 125 | 125 |
| 110 | 1 | 208 | 60 | 274 | 3 | 300 MCM | 1 | 2.5 | 300 | 300 |
| | | 230 | | 274 | 3 | 300 MCM | 1 | 2.5 | 300 | 300 |
| | | 460 | | 114 | 3 | 2 AWG | 1 | 1.3 | 125 | 125 |
| | | 575 | | 94 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | 2 | 208 | 60 | 274 | 3 | 300 MCM | 1 | 2.5 | 300 | 300 |
| | | 230 | | 274 | 3 | 300 MCM | 1 | 2.5 | 300 | 300 |
| | | 460 | | 114 | 3 | 2 AWG | 1 | 1.3 | 125 | 125 |
| | | 575 | | 94 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| 125 | 1 | 208 | 60 | 312 | 3 | 400 MCM | 1 | 2.5 | 350 | 350 |
| | | 230 | | 312 | 3 | 400 MCM | 1 | 2.5 | 350 | 350 |
| | | 460 | | 114 | 3 | 2 AWG | 1 | 1.3 | 125 | 125 |
| | | 575 | | 94 | 3 | 3 AWG | 1 | 1.0 | 110 | 110 |
| | 2 | 208 | 60 | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 230 | | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 460 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | | 575 | | 117 | 3 | 1 AWG | 1 | 1.3 | 125 | 125 |
| 130 | 1 | 208 | 60 | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 230 | | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 460 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | | 575 | | 117 | 3 | 1 AWG | 1 | 1.3 | 125 | 125 |
| | 2 | 208 | 60 | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 230 | | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 460 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | | 575 | | 117 | 3 | 1 AWG | 1 | 1.3 | 125 | 125 |

## *Electrical Data, Multi-Point, Continued*

| AGZ UNIT SIZE | CIR-CUIT | VOLTS | HZ | MIN. CIRCUIT AMPACITY (MCA) | POWER SUPPLY | | | | FIELD FUSE OR. CKT. BREAKER SIZE | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FIELD WIRE | | HUB, FIELD SUPPLIED (IN.) | | | |
| | | | | | QTY | WIRE GA | QTY | NOM. SIZE | RECOM. | MAX. |
| 140 | 1 | 208 | 60 | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 230 | | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 460 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | | 575 | | 117 | 3 | 1 AWG | 1 | 1.3 | 125 | 125 |
| | 2 | 208 | 60 | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 230 | | 321 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 460 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | | 575 | | 117 | 3 | 1 AWG | 1 | 1.3 | 125 | 125 |
| 160 | 1 | 208 | 60 | 329 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 230 | | 329 | 3 | 400 MCM | 1 | 2.5 | 400 | 400 |
| | | 460 | | 163 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | | 575 | | 120 | 3 | 1 AWG | 1 | 1.3 | 150 | 150 |
| | 2 | 208 | 60 | 415 | 6 | 300 MCM | 1 | 3.5 | 500 | 500 |
| | | 230 | | 415 | 6 | 300 MCM | 1 | 3.5 | 500 | 500 |
| | | 460 | | 196 | 3 | 3/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 575 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| 180 | 1 | 208 | 60 | 454 | 6 | 300 MCM | 1 | 3.5 | 500 | 500 |
| | | 230 | | 415 | 6 | 300 MCM | 1 | 3.5 | 500 | 500 |
| | | 460 | | 204 | 3 | 4/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 575 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | 2 | 208 | 60 | 454 | 6 | 300 MCM | 1 | 3.5 | 500 | 500 |
| | | 230 | | 415 | 6 | 300 MCM | 1 | 3.5 | 500 | 500 |
| | | 460 | | 204 | 3 | 4/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 575 | | 160 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| 190 | 1 | 208 | 60 | 462 | 6 | 250 MCM | 2 | 2.0 | 500 | 500 |
| | | 230 | | 423 | 6 | 4/0 AWG | 2 | 2.0 | 500 | 500 |
| | | 460 | | 208 | 3 | 4/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 575 | | 163 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |
| | 2 | 208 | 60 | 462 | 6 | 250 MCM | 2 | 2.0 | 500 | 500 |
| | | 230 | | 423 | 6 | 4/0 AWG | 2 | 2.0 | 500 | 500 |
| | | 460 | | 208 | 3 | 4/0 AWG | 1 | 2.0 | 250 | 250 |
| | | 575 | | 163 | 3 | 2/0 AWG | 1 | 1.5 | 200 | 200 |

1. See page 62 for notes.

# Wiring Data, Multi-Point

***Table 35, Wiring Data, Multi-Point***

| AGZ UNIT SIZE | CIR-CUIT | VOLTS | POWER BLOCK | | HIGH SCCR CIRCUIT BREAKER | | DISCONNECT SWITCH | |
|---|---|---|---|---|---|---|---|---|
| | | | SIZE | LUG RANGE | SIZE | LUG RANGE | SIZE | LUG RANGE |
| 030 | 1 | 208 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 100 | (1) 1/0 - #10 |
| | | 230 | 175 | (1) 2/0 - #14 | 100 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 45 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 100 | (1) 1/0 - #10 |
| | | 230 | 175 | (1) 2/0 - #14 | 100 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 45 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 035 | 1 | 208 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 100 | (1) 1/0 - #10 |
| | | 230 | 175 | (1) 2/0 - #14 | 100 | (1) 3/0- #3 | 100 | (1) 1/0 - #10 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 45 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 230 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 45 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 040 | 1 | 208 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 230 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 45 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 230 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 45 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 045 | 1 | 208 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | | 230 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 50 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | | 230 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 60 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 50 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 050 | 1 | 208 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 70 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 70 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 055 | 1 | 208 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 70 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |

See page 62 for notes.

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***Table 35, Wiring Data, Multi-Point, Continued***

| AGZ UNIT SIZE | CIR-CUIT | VOLTS | POWER BLOCK | | HIGH SCCR CIRCUIT BREAKER | | DISCONNECT SWITCH | |
|---|---|---|---|---|---|---|---|---|
| | | | SIZE | LUG RANGE | SIZE | LUG RANGE | SIZE | LUG RANGE |
| 060 | 1 | 208 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 065 | 1 | 208 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 070 | 1 | 208 | 380 | (1) 500 - #4 | 225 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 225 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 100 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 380 | (1) 500 - #4 | 225 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 225 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 100 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | | 575 | 175 | (1) 2/0 - #14 | 80 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 075 | 1 | 208 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 575 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 575 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| 080 | 1 | 208 | 380 | (1) 500 - #4 | 250 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | | 230 | 380 | (1) 500 - #4 | 250 | (2) 500- 3/0 | 250 | (1) 350 - #4 |
| | | 460 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | | 575 | 175 | (1) 2/0 - #14 | 90 | (1) 1/0 - #10 | 100 | (1) 1/0 - #10 |
| | 2 | 208 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| 090 | 1 | 208 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | 2 | 208 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |

See page 62 for notes.

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***Table 35, Wiring Data, Multi-Point, Continued***

| AGZ UNIT SIZE | CIR-CUIT | VOLTS | POWER BLOCK | | HIGH SCCR CIRCUIT | | DISCONNECT | |
|---|---|---|---|---|---|---|---|---|
| | | | SIZE | LUG RANGE | SIZE | LUG RANGE | SIZE | LUG RANGE |
| 100 | 1 | 208 | 380 | (1) 500 - #4 | 350 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 380 | (1) 500 - #4 | 350 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | 2 | 208 | 380 | (1) 500 - #4 | 350 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 380 | (1) 500 - #4 | 350 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 175 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| 110 | 1 | 208 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | 2 | 208 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 380 | (1) 500 - #4 | 300 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| 125 | 1 | 208 | 760 | (2) 500 - #4 | 350 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 350 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 110 | (1) 3/0- #3 | 125 | (1) 3/0- #3 |
| | 2 | 208 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| 130 | 1 | 208 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| | 2 | 208 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| 140 | 1 | 208 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| | 2 | 208 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 125 | (1) 3/0- #3 | 250 | (1) 350 - #4 |
| 160 | 1 | 208 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 400 | (2) 500- 3/0 | 400 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 150 | (1) 3/0- #4 | 250 | (1) 350 - #4 |
| | 2 | 208 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| 180 | 1 | 208 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | 2 | 208 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |

See page 62 for notes.

***Table 35, Wiring Data, Multi-Point, Continued***

| UNIT SIZE | CIR-CUIT | VOLTS | POWER BLOCK | | HIGH SCCR CIRCUIT | | DISCONNECT | |
|---|---|---|---|---|---|---|---|---|
| | | | SIZE | LUG RANGE | SIZE | LUG RANGE | SIZE | LUG RANGE |
| 190 | 1 | 208 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| 190 | 2 | 208 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 230 | 760 | (2) 500 - #4 | 500 | (2) 500- 3/0 | 600 | (2) 500- 3/0 |
| | | 460 | 380 | (1) 500 - #4 | 250 | (1) 350 - #4 | 250 | (1) 350 - #4 |
| | | 575 | 175 | (1) 2/0 - #14 | 200 | (1) 350 - #4 | 250 | (1) 350 - #4 |

## Notes for “Electrical Data

1. Unit wire size ampacity (MCA) is equal to 125% of the largest compressor-motor RLA plus 100% of RLA of all other loads.
2. The control transformer is furnished and no separate 115V power is required. For both single- and multi-point power connections, the control transformer is in circuit #1 with control power wired from there to circuit #2. In multi-point power, disconnecting power to circuit #1 will disconnect all control power to the unit.
3. If a separate 115V power supply is used for the control circuit, then the wire sizing amps is 10 amps for all unit sizes.
4. Recommended power lead wire sizes for 3 conductors per conduit are based on 100% conductor ampacity in accordance with NEC. Voltage drop has not been included. Therefore, it is recommended that power leads be kept short. All terminal block connections must be made with copper (type THW) wire.
5. “Recommended Fuse Sizes” are selected at approximately 175% of the largest compressor RLA, plus 100% of all other loads in the circuit.
6. “Maximum Fuse or breaker size” is equal to 225% of the largest compressor RLA, plus 100% of all other loads in the circuit.
7. The recommended power lead wire sizes are based on an ambient temperature of 86° F (30° C). Ampacity correction factors must be applied for other ambient temperatures. Refer to the National Electrical Code Handbook.
8. Must be electrically grounded according to national and local electrical codes.

Voltage Limitations:

1. Within ± 10 percent of nameplate rating.
2. Voltage unbalance not to exceed 2% with a resultant current unbalance of 6 to 10 times the voltage unbalance per NEMA MG-1, 1998 Standard.

Notes for “Compressor and Condenser Fan Amp Draw”:

1. Compressor RLA values are for wiring sizing purposes only. Normal operating current draw at rated capacity may be less than the RLA value.

Notes for “Field Wiring Data”

1. Single-point power supply requires a single disconnect to supply electrical power to the unit. This power supply must either be fused or use a circuit breaker.
2. All field wiring to unit must be copper.
3. All field wire size values given in table apply to 75° C rated wire per NEC.

## Circuit Breakers

Factory installed compressor circuit breakers are standard on units with single point power supply only. This option provides unit installed compressor short circuit protection and makes servicing easier.

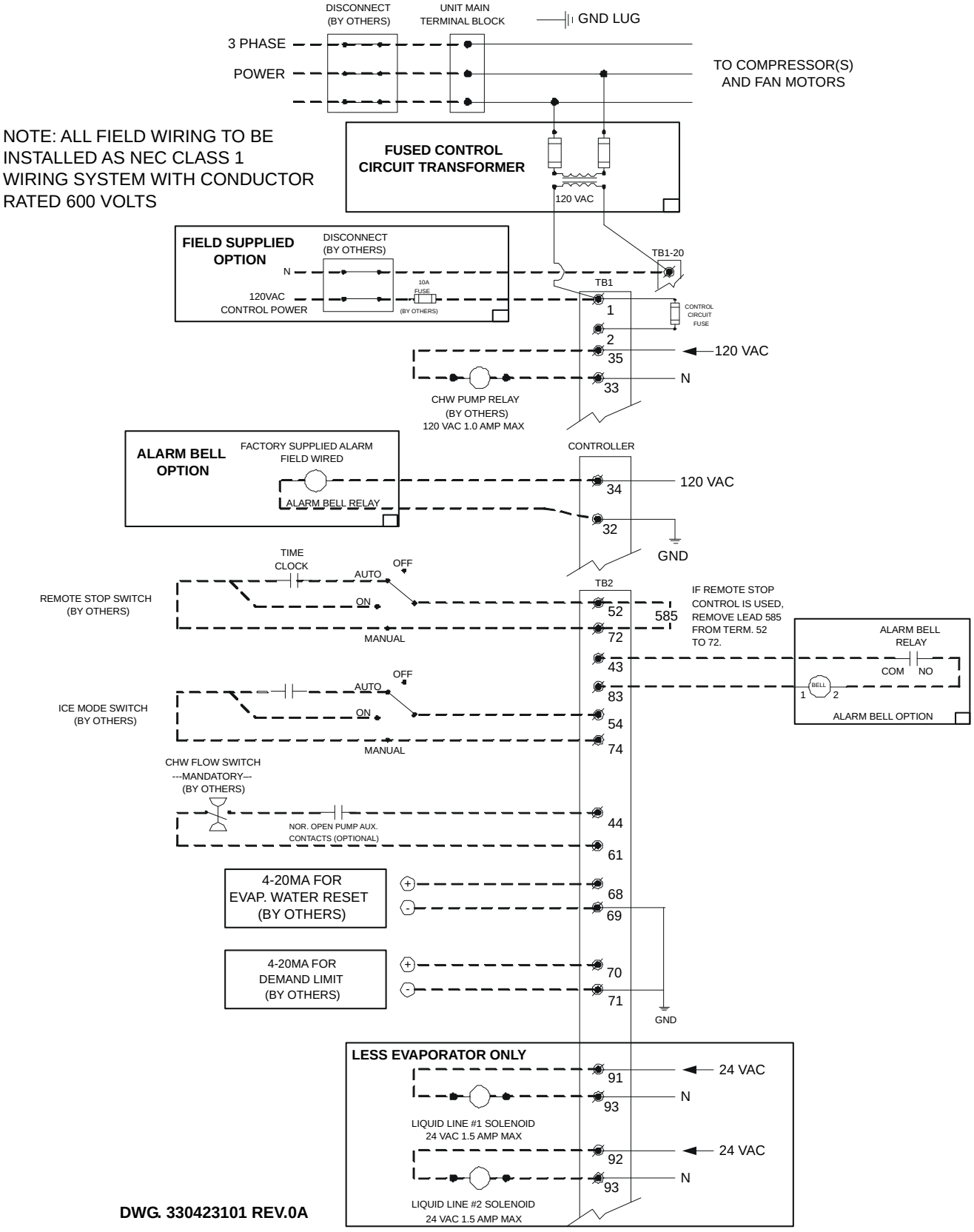
The circuit breaker used in the High Short Circuit panel option may have a higher trip rating than the unit Maximum Overload Protection (MOP) value shown on the unit nameplate. The circuit breaker is installed as a service disconnect switch and does not function as branch circuit protection, mainly that the protection device must be installed at the point of origin of the power wiring. The breaker (disconnect switch) is oversized to avoid nuisance trips at high ambient temperature conditions.

## High Short Circuit

A High Short Circuit Current Rated panel has all high-rated components and the panel is so labeled.

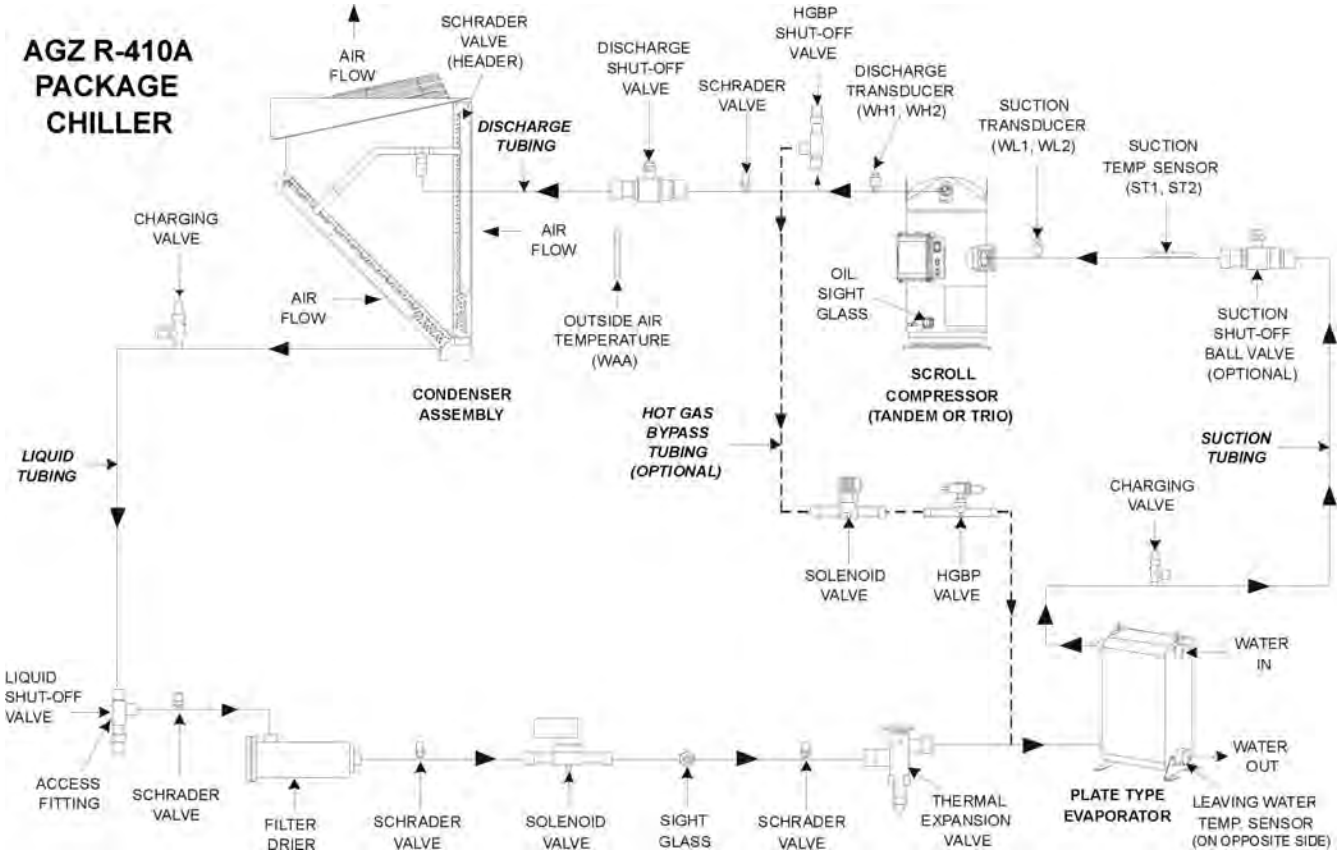
A High Interrupt Disconnect Switch applies to the switch only and the panel has no special labeling.

***Figure 24, Field Wiring Diagram***




**NOTE**: Single-point connection shown. Multi-point connection adds an additional landing point for Circuit #2. The control power remains off of Circuit #1 as shown.

***Figure 25, AGZ 030CH – AGZ 190CH, Typical Piping Schematic, Packaged Unit***

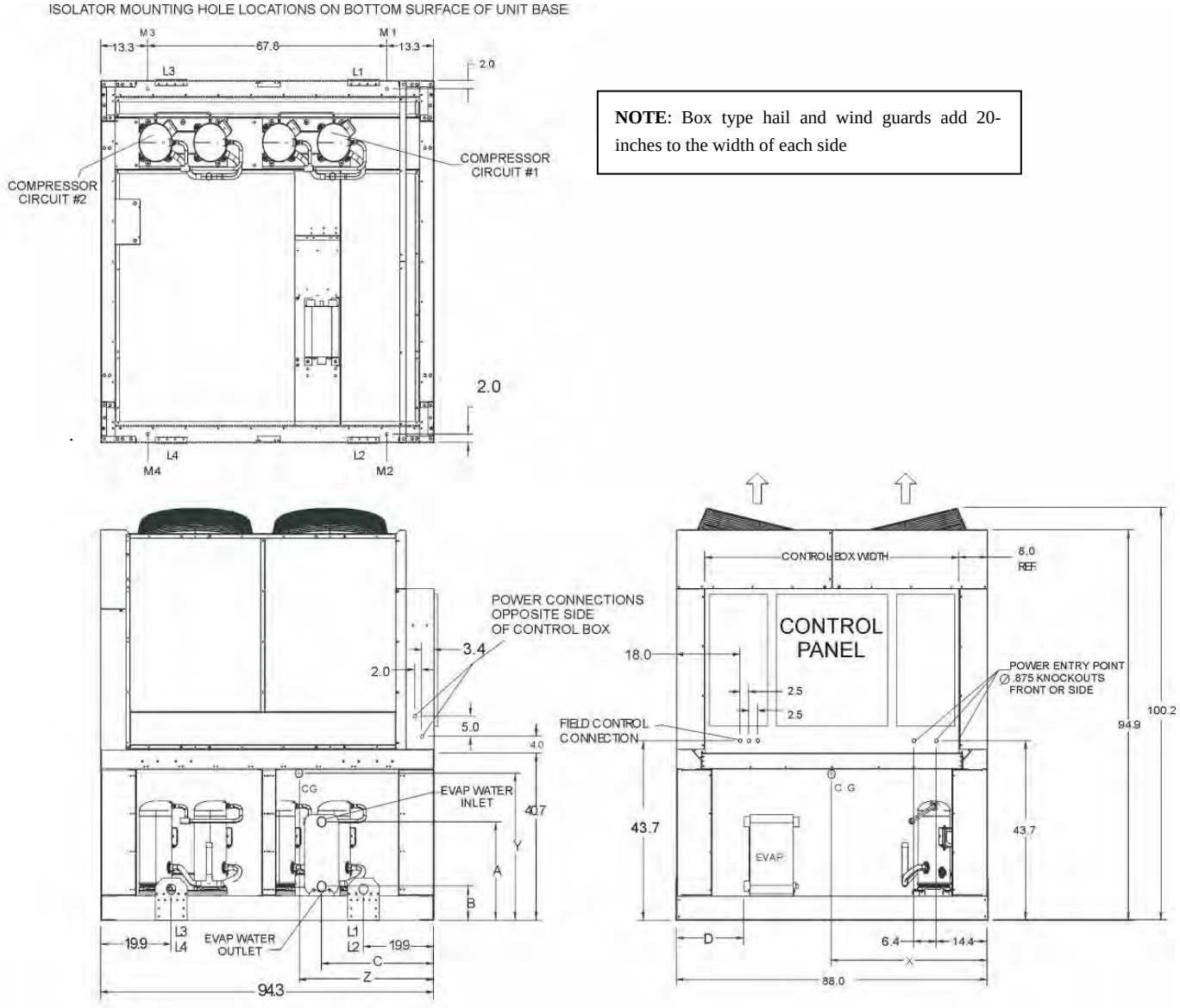



**Note:** Models AGZ 140 through 190 have shell-and-tube evaporators in lieu of the brazed-plate shown above.

# Dimensions

## Packaged Units

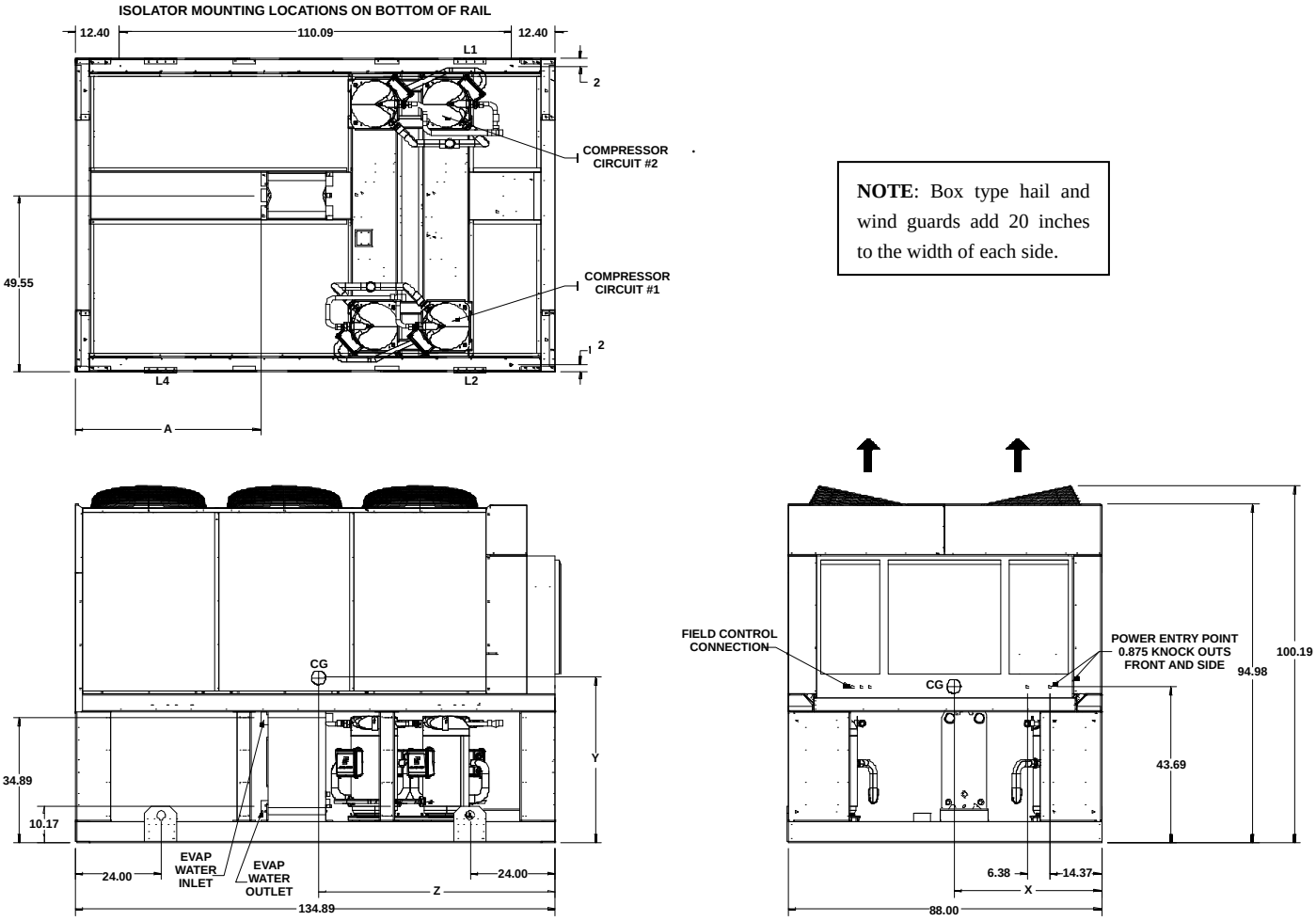
***Figure 26, Dimensions, AGZ 030CH – 070CH, Packaged Chiller***




**NOTE**: Box type hail and wind guards add 20-inches to the width of each side

| UNIT MODEL | CG LOCATION (in.) | | | SHIP WEIGHT (lbs) | OPN. WEIGHT (lbs) | LIFTING WEIGHT BY CORNER (lbs) | | | | VICTAULIC CONN. SIZE (in.) | EVAP DIMENSIONS (in.) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | | A | B | C | D |
| **AGZ030C** | 37.8 | 42.9 | 42.3 | 3180 | 3195 | 1069 | 806 | 745 | 561 | Ø2.5 | 24.0 | 8.3 | 33.8 | 23.2 |
| **AGZ035C** | 37.9 | 42.8 | 42.3 | 3185 | 3205 | 1070 | 810 | 743 | 562 | Ø2.5 | 24.0 | 8.3 | 33.8 | 22.2 |
| **AGZ040C** | 38.1 | 43.3 | 42.5 | 3265 | 3285 | 1084 | 829 | 766 | 586 | Ø2.5 | 24.0 | 8.3 | 33.8 | 20.8 |
| **AGZ045C** | 38.6 | 44.3 | 42.7 | 3420 | 3445 | 1116 | 871 | 805 | 628 | Ø2.5 | 24.0 | 8.3 | 33.8 | 19.0 |
| **AGZ050C** | 38.7 | 44.0 | 42.6 | 3495 | 3525 | 1143 | 898 | 815 | 640 | Ø2.5 | 24.0 | 8.3 | 33.8 | 17.3 |
| **AGZ055C** | 38.8 | 44.9 | 42.6 | 3525 | 3555 | 1150 | 908 | 820 | 647 | Ø2.5 | 24.0 | 8.3 | 33.8 | 15.6 |
| **AGZ060C** | 39.1 | 45.8 | 42.4 | 3710 | 3760 | 1210 | 967 | 852 | 681 | Ø3.0 | 33.5 | 8.8 | 32.9 | 19.3 |
| **AGZ065C** | 39.3 | 45.6 | 42.4 | 3740 | 3795 | 1216 | 980 | 855 | 689 | Ø3.0 | 33.5 | 8.8 | 32.9 | 18.0 |
| **AGZ070C** | 36.7 | 39.3 | 44.2 | 4150 | 4205 | 1342 | 960 | 1078 | 771 | Ø3.0 | 33.5 | 8.8 | 32.9 | 18.0 |

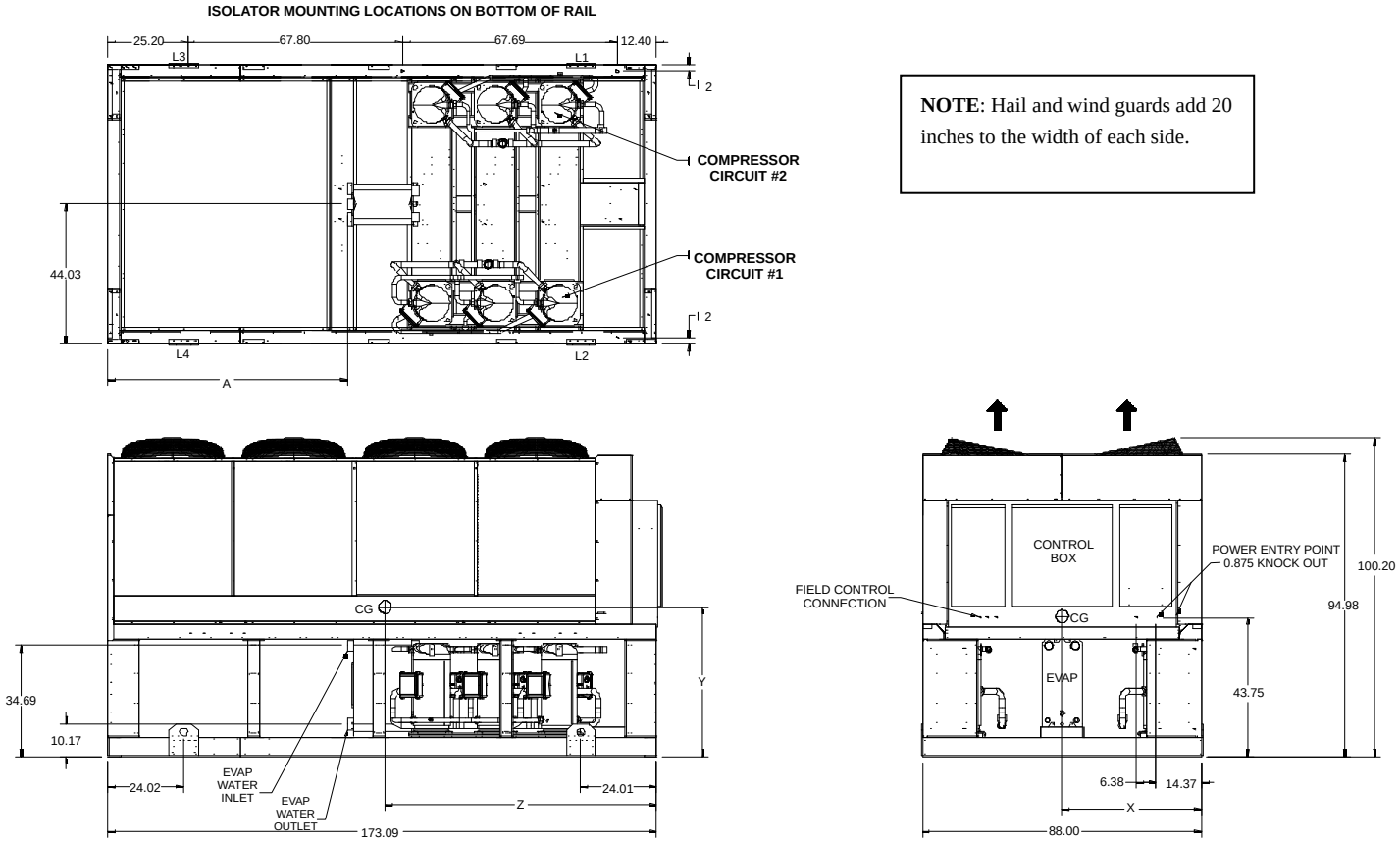
### *Figure 27, Dimensions, AGZ 075CH – 100CH Packaged Chiller*




**NOTE**: Box type hail and wind guards add 20 inches to the width of each side.

| UNIT MODEL | CG LOCATION (in.) | | | SHIPPING WEIGHT (lbs) | OPERATING WEIGHT (lbs) | CORNER LIFTING WEIGHT (in.) | | | | VICTAULIC CONN. SIZE (in.) | EVAP DIM. (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | | A |
| **AGZ075C** | 43.6 | 43.5 | 54.8 | 5460 | 5510 | 1780 | 1748 | 975 | 958 | Ø3.0 | 54.7 |
| **AGZ080C** | 44.0 | 45.3 | 52.9 | 5545 | 5600 | 1851 | 1851 | 922 | 921 | Ø3.0 | 53.8 |
| **AGZ090C** | 43.6 | 46.8 | 54.6 | 5645 | 5710 | 1846 | 1810 | 1004 | 985 | Ø3.0 | 52.0 |
| **AGZ100C** | 43.6 | 46.6 | 54.5 | 5750 | 5815 | 1885 | 1848 | 1019 | 999 | Ø3.0 | 51.1 |

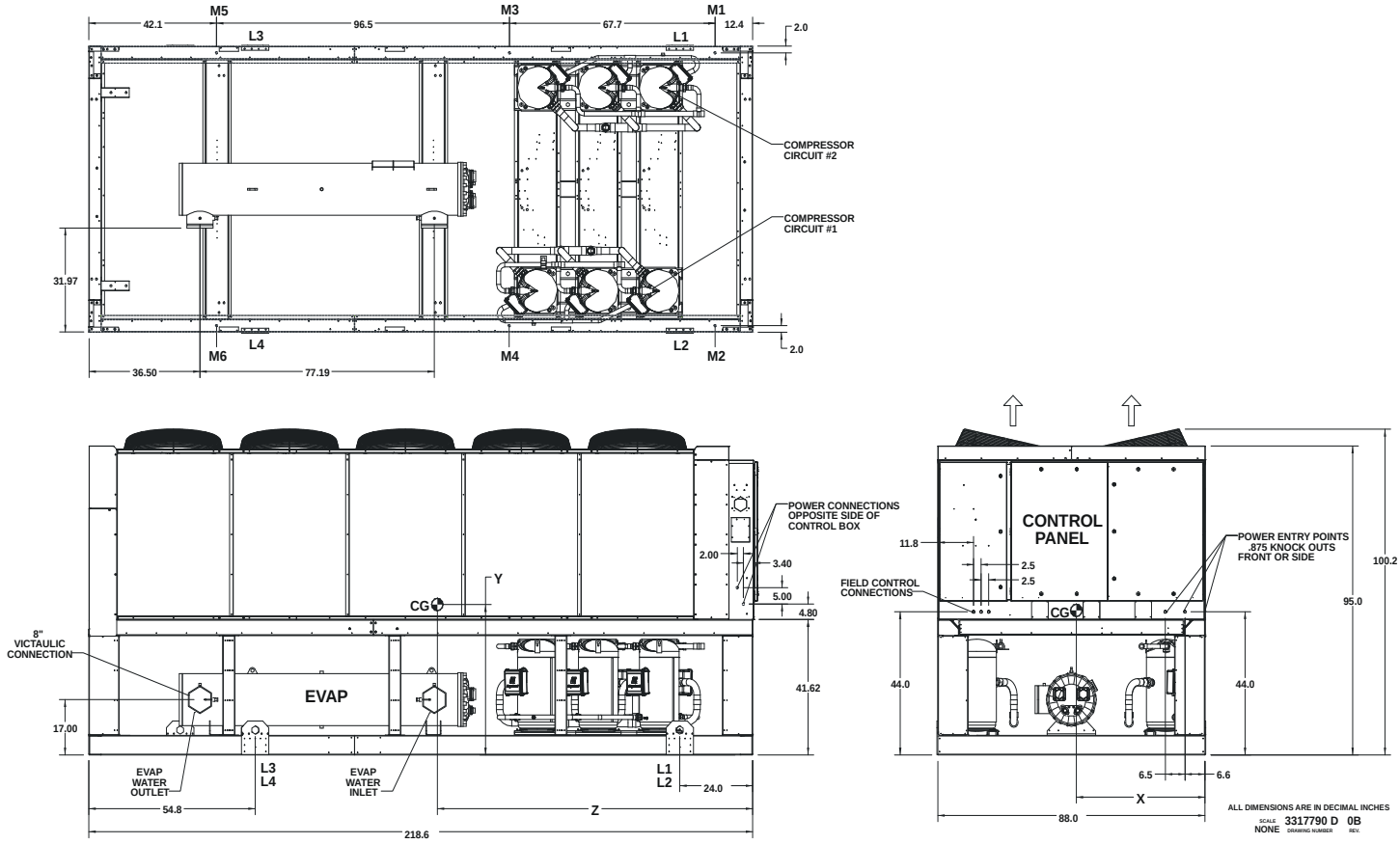
## *Figure 28, Dimensions, AGZ 110CH – 130CH, Packaged Chiller*




**NOTE**: Hail and wind guards add 20 inches to the width of each side.

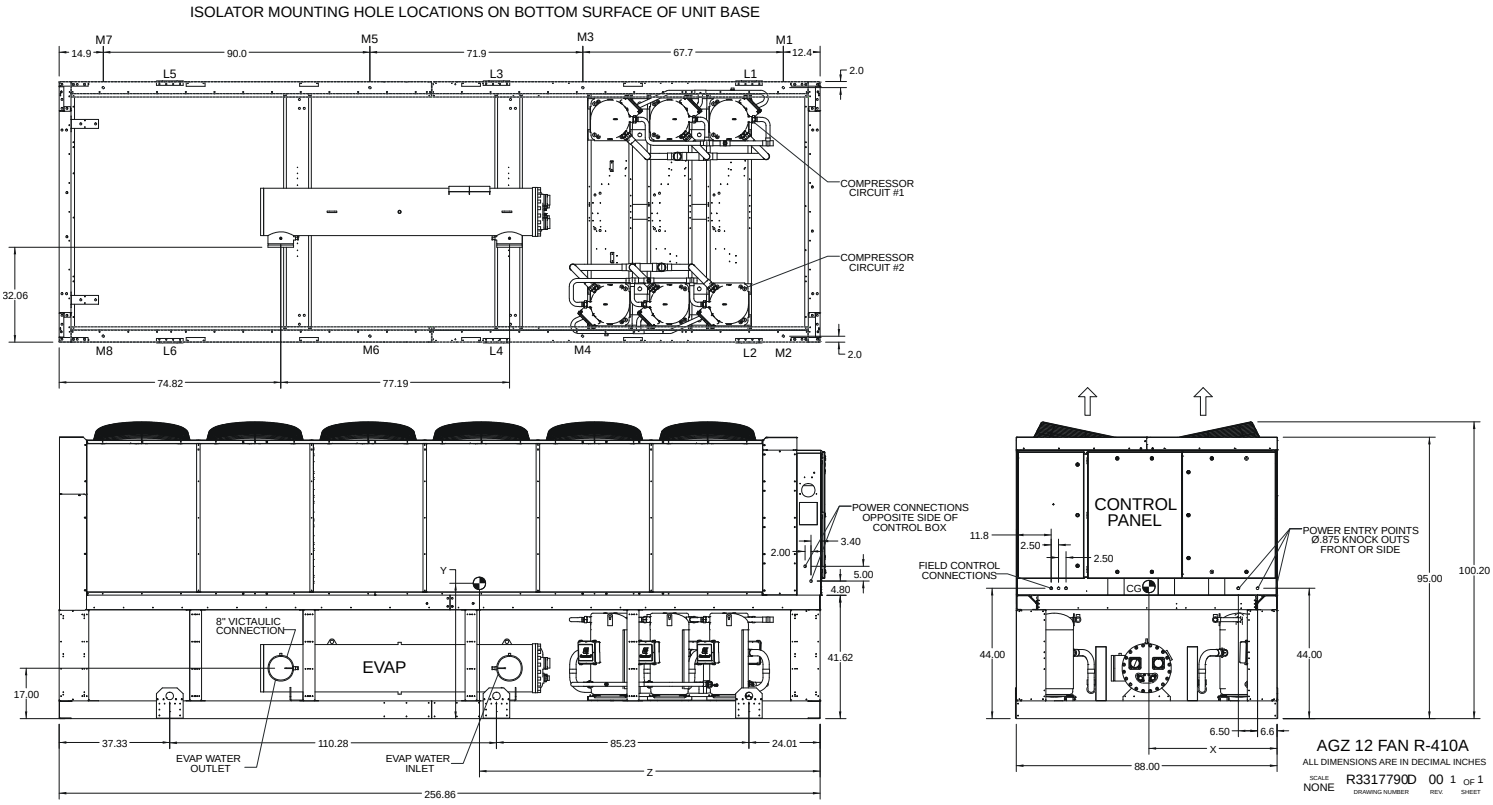
| UNIT MODEL | CG LOCATION (in.) | | | SHIPPING WEIGHT (lbs) | OPERATING WEIGHT (lbs) | CORNER LIFTING WEIGHT (in.) | | | | VICTAULIC CONN. SIZE (in.) | EVAP DIM (in.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | | A |
| **AGZ110C** | 44.0 | 42.9 | 69.0 | 7200 | 7270 | 2305 | 2307 | 1294 | 1295 | Ø3.0 | 75.5 |
| **AGZ125C** | 43.4 | 44.1 | 68.9 | 7420 | 7500 | 2411 | 2346 | 1350 | 1314 | Ø3.0 | 73.3 |
| **AGZ130C** | 44.0 | 45.3 | 68.9 | 7570 | 7665 | 2426 | 2426 | 1359 | 1359 | Ø3.0 | 70.2 |

## *Figure 29, Dimensions, AGZ 140CH – 180CH, Packaged Chiller*




| UNIT MODEL | CG LOCATION (in.) | | | SHIPPING WEIGHT (lbs) | OPERATING WEIGHT (lbs) | LIFTING WEIGHT BY CORNER (lbs) | | | | VICTAULIC CONN. SIZE (in.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | |
| **AGZ140C** | 43.4 | 46.0 | 86.0 | 9310 | 9792 | 2631 | 2555 | 2092 | 2032 | 8 |
| **AGZ160C** | 43.0 | 42.8 | 85.4 | 9460 | 9942 | 2715 | 2592 | 2125 | 2029 | 8 |
| **AGZ180C** | 43.4 | 39.6 | 85.2 | 9625 | 10107 | 2746 | 2670 | 2134 | 2075 | 8 |

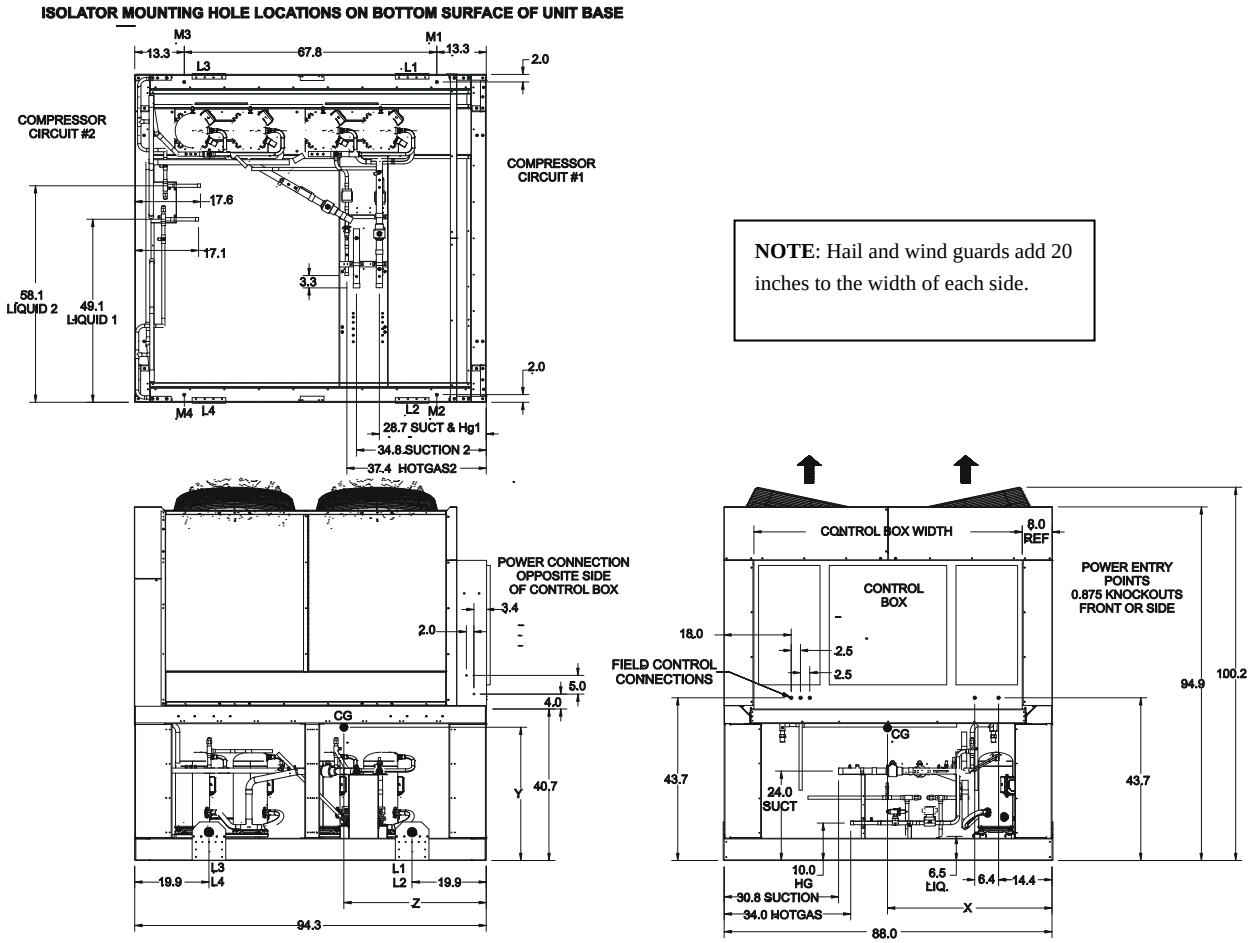
## *Figure 30, Dimensions, AGZ 190CH, Packaged Chiller*




| UNIT MODEL | CG LOCATION (in.) | | | SHIPPING WEIGHT (lbs) | OPERATING WEIGHT (lbs) | LIFTING WEIGHT BY CORNER (lbs) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | L5 | L6 |
| **AGZ190C** | 43.3 | 42.9 | 92.9 | 10585 | 11070 | 2280 | 2245 | 1823 | 1795 | 1231 | 1212 |

# Remote Evaporator

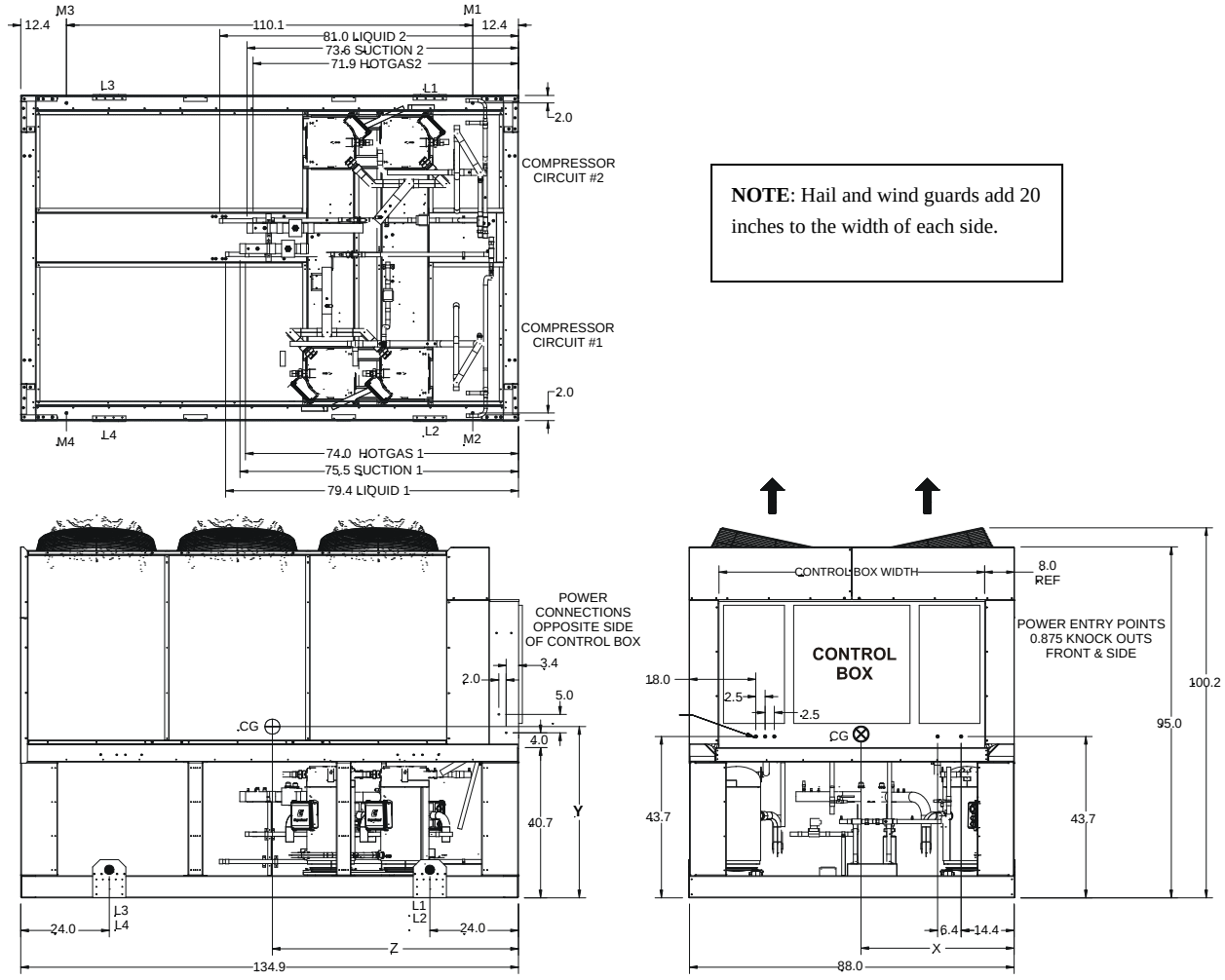
***Figure 31, Dimensions, AGZ 030CB – 070CB, w/ Remote Evaporator***




**NOTE**: Hail and wind guards add 20 inches to the width of each side.

| UNIT MODEL | CG LOCATION (IN) | | | SHIPPING WEIGHT (LBS) | OPERATING WEIGHT (LBS) | LIFTING WEIGHT BY CORNER (LBS) | | | | REFRIG CONNECTIONS (IN>) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | SUCT. O.D. | LIQ. O.D. | HGBP O.D. |
| **AGZ030C** | 37.8 | 42.9 | 42.3 | 3180 | 3195 | 1069 | 806 | 745 | 561 | 1.625 | 0.875 | 0.875 |
| **AGZ035C** | 37.9 | 42.8 | 42.3 | 3185 | 3205 | 1070 | 810 | 743 | 562 | 1.625 | 0.875 | 0.875 |
| **AGZ040C** | 38.1 | 43.3 | 42.5 | 3265 | 3285 | 1084 | 829 | 766 | 586 | 1.625 | 0.875 | 0.875 |
| **AGZ045C** | 38.6 | 44.3 | 42.7 | 3420 | 3445 | 1116 | 871 | 805 | 628 | 1.625 | 0.875 | 0.875 |
| **AGZ050C** | 38.7 | 44.0 | 42.6 | 3495 | 3525 | 1143 | 898 | 815 | 640 | 1.625 | 0.875 | 0.875 |
| **AGZ055C** | 38.8 | 44.9 | 42.6 | 3525 | 3555 | 1150 | 908 | 820 | 647 | 1.625 | 0.875 | 0.875 |
| **AGZ060C** | 39.1 | 45.8 | 42.4 | 3710 | 3760 | 1210 | 967 | 852 | 681 | 1.625 | 0.875 | 0.875 |
| **AGZ065C** | 39.3 | 45.6 | 42.4 | 3740 | 3795 | 1216 | 980 | 855 | 689 | 1.625 | 0.875 | 0.875 |
| **AGZ070C** | 36.7 | 39.3 | 44.2 | 4150 | 4205 | 1342 | 960 | 1078 | 771 | 2.125 | 0.875 | 0.875 |

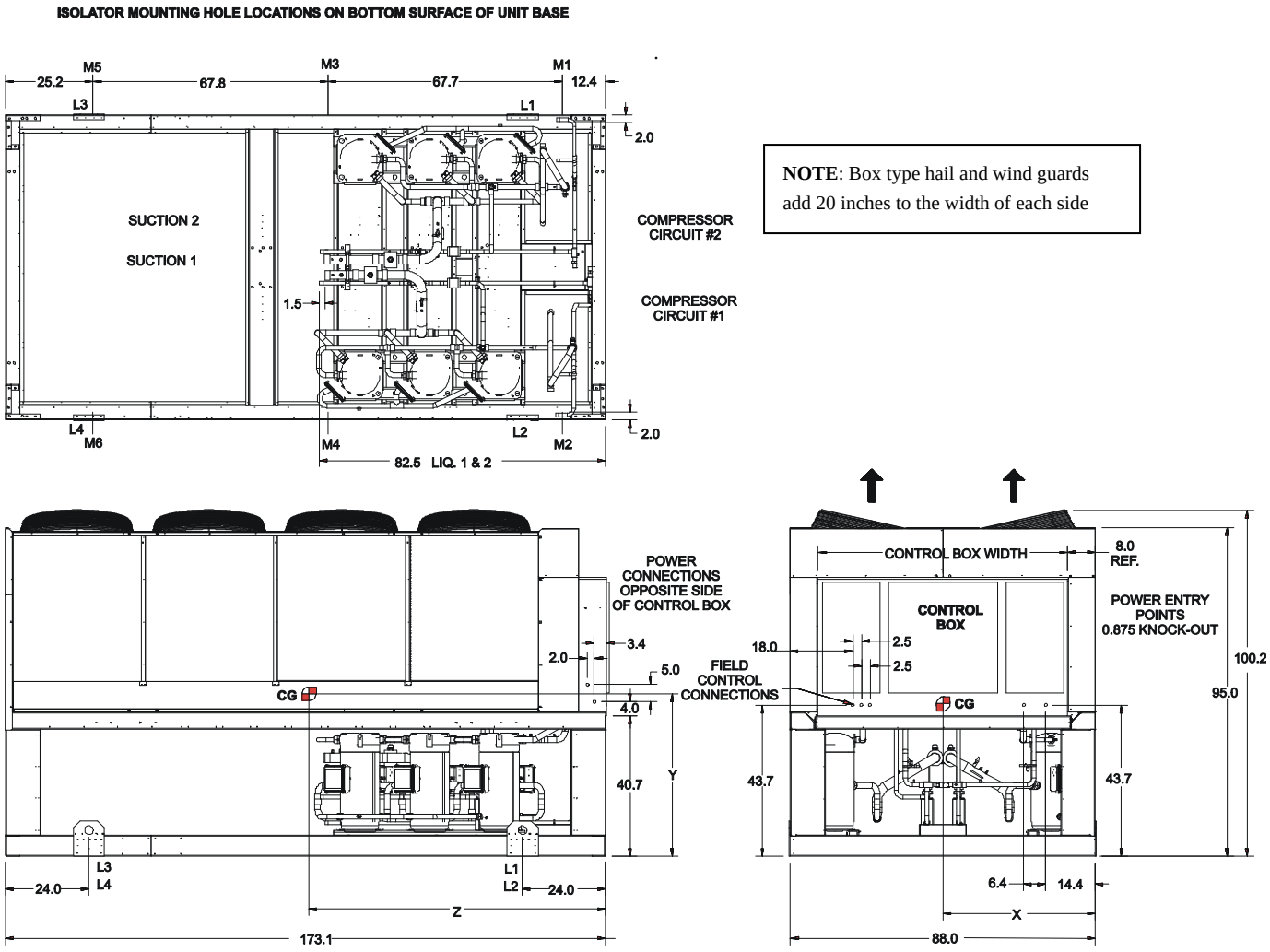
### *Figure 32, Dimensions, AGZ 075CB – 100CB, w/ Remote Evaporator*




**NOTE**: Hail and wind guards add 20 inches to the width of each side.

| UNIT MODEL | CG LOCATION (in.) | | | SHIPPING WEIGHT (lbs) | OPERATING WEIGHT (lbs) | LIFTING WEIGHT BY CORNER (lbs) | | | | REFRIG CONNECTIONS (in.) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | SUCT. O.D. | LIQ. O.D. | HGBP O.D. |
| **AGZ075C** | 43.9 | 44.8 | 54.2 | 5065 | 5225 | 1657 | 1650 | 881 | 878 | 2.625 | 1.125 | 1.125 |
| **AGZ080C** | 44.1 | 46.6 | 51.9 | 5160 | 5320 | 1747 | 1756 | 827 | 831 | 2.625 | 1.125 | 1.125 |
| **AGZ090C** | 43.9 | 47.4 | 52.3 | 5220 | 5390 | 1764 | 1757 | 851 | 848 | 2.625 | 1.125 | 1.125 |
| **AGZ100C** | 43.9 | 47.4 | 52.3 | 5300 | 5480 | 1791 | 1784 | 864 | 861 | 2.625 | 1.125 | 1.125 |

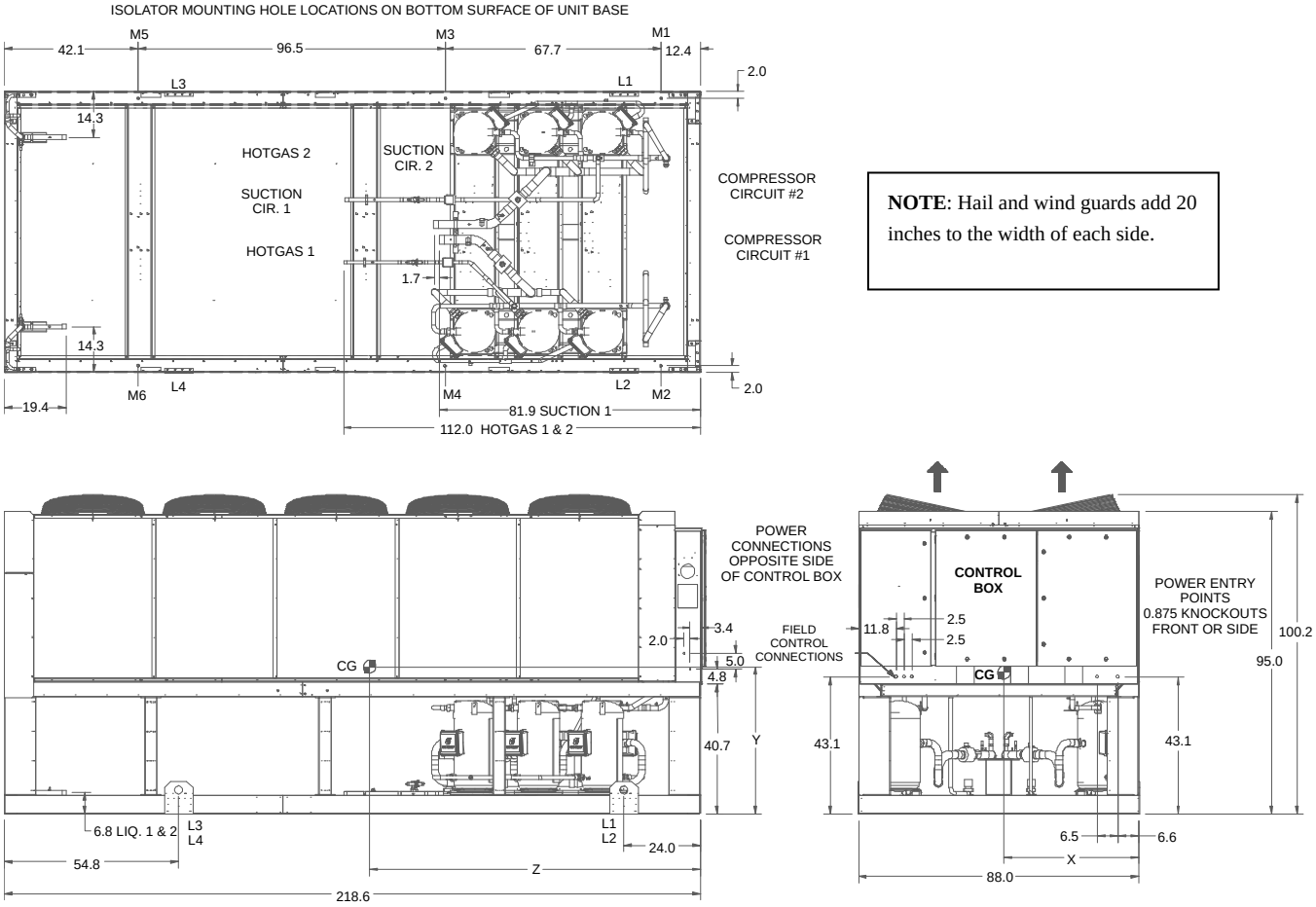
## *Figure 33, Dimensions, AGZ 100CB – 130CB, w/Remote Evaporator*




**NOTE**: Box type hail and wind guards add 20 inches to the width of each side

| UNIT MODEL | CG LOCATION (IN) | | | SHIPPING WEIGHT (lbs) | OPERATING WEIGHT (lbs) | LIFTING WEIGHT BY CORNER (lbs) | | | | R |
|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | S |
| **AGZ110C** | 44.0 | 44.5 | 68.4 | 5830 | 6035 | 1880 | 1882 | 1034 | 1035 | |
| **AGZ125C** | 43.4 | 45.5 | 68.4 | 5995 | 6215 | 1961 | 1906 | 1079 | 1049 | |
| **AGZ130C** | 44.0 | 47.0 | 68.2 | 6085 | 6315 | 1967 | 1967 | 1075 | 1075 | |

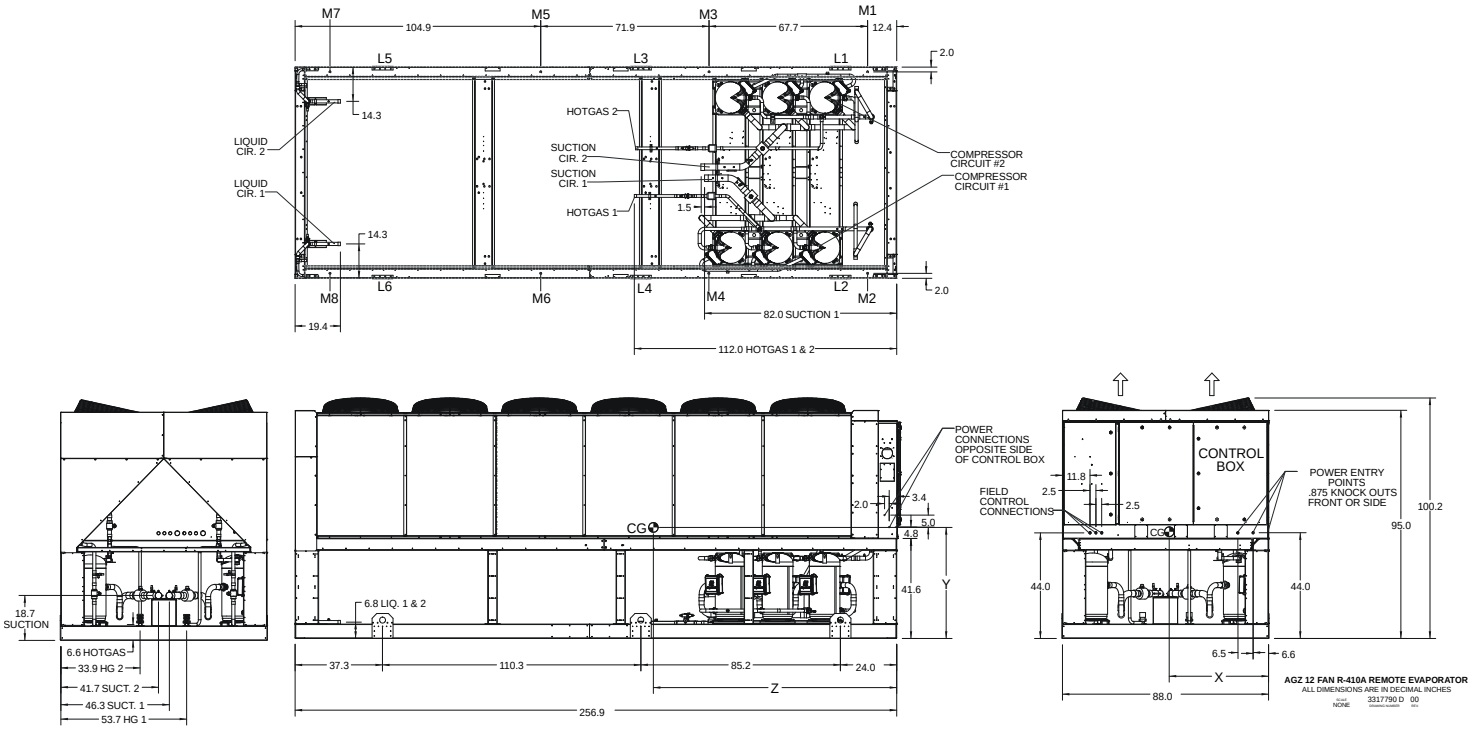
## *Figure 34, Dimensions, AGZ140CB - 180CB, Remote Evaporator*




**NOTE**: Hail and wind guards add 20 inches to the width of each side.

| UNIT MODEL | CG LOCATION (IN) | | | SHIPPING WEIGHT (LBS) | OPERATING WEIGHT (LBS) | LIFTING WEIGHT BY CORNER (LBS) | | | | REFRIGERANT CONNECTIONS (IN.) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | SUCTION O.D. | LIQUID O.D. | HOTGAS O.D. |
| **AGZ140C** | 43.4 | 46.1 | 85.3 | 9155 | 9530 | 2608 | 2537 | 2033 | 1977 | 2.625 | 1.375 | 1.125 |
| **AGZ160C** | 43.0 | 42.8 | 84.6 | 9320 | 9680 | 2700 | 2578 | 2068 | 1974 | 2.625 | 1.375 | 1.125 |
| **AGZ180C** | 43.4 | 39.6 | 84.2 | 9470 | 9830 | 2734 | 2658 | 2068 | 2011 | 2.625 | 1.375 | 1.125 |

## *Figure 35, Dimensions, AGZ190CB, Remote Evaporator*

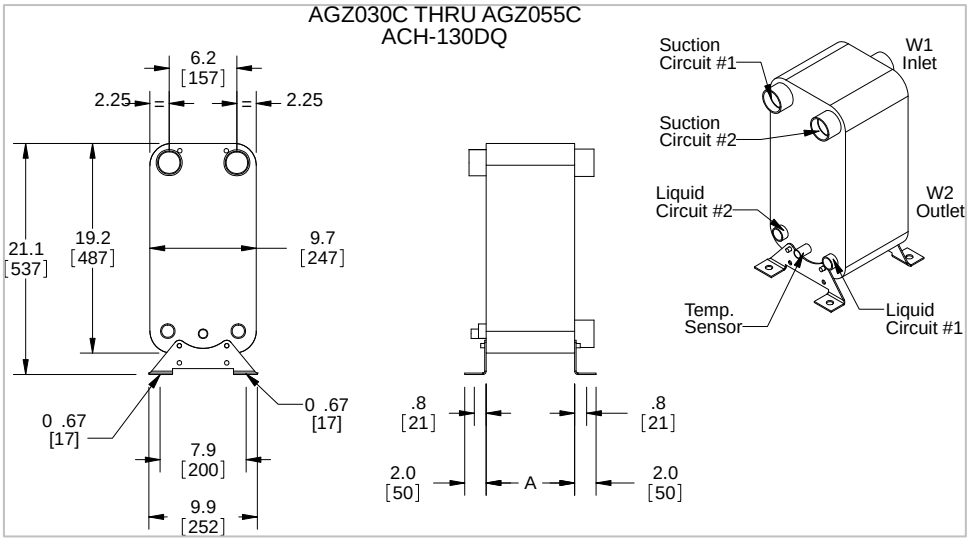


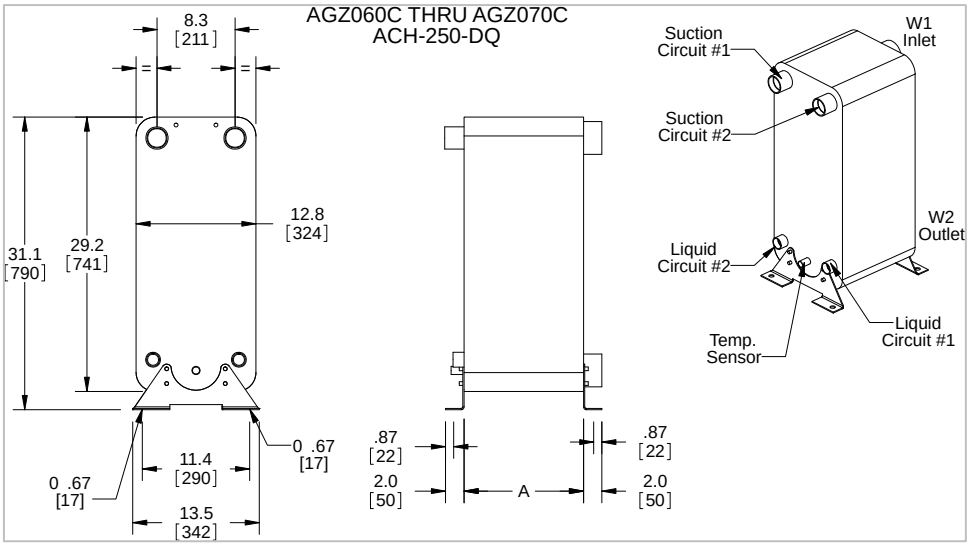

| UNIT MODEL | CG LOCATION (IN) | | | SHIPPING WEIGHT (LBS) | OPERATING WEIGHT (LBS) | LIFTING WEIGHT BY CORNER (LBS) | | | | | | REFRIGERANT CONNECTIONS(IN.) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X | Y | Z | | | L1 | L2 | L3 | L4 | L5 | L6 | SUCTION O.D. | LIQUID O.D. | HOTGAS O.D. |
| **AGZ190C** | 43.4 | 42.9 | 92.9 | 9685 | 9965 | 2232 | 2160 | 1693 | 1639 | 997 | 964 | 2.625 | 1.375 | 1.125 |

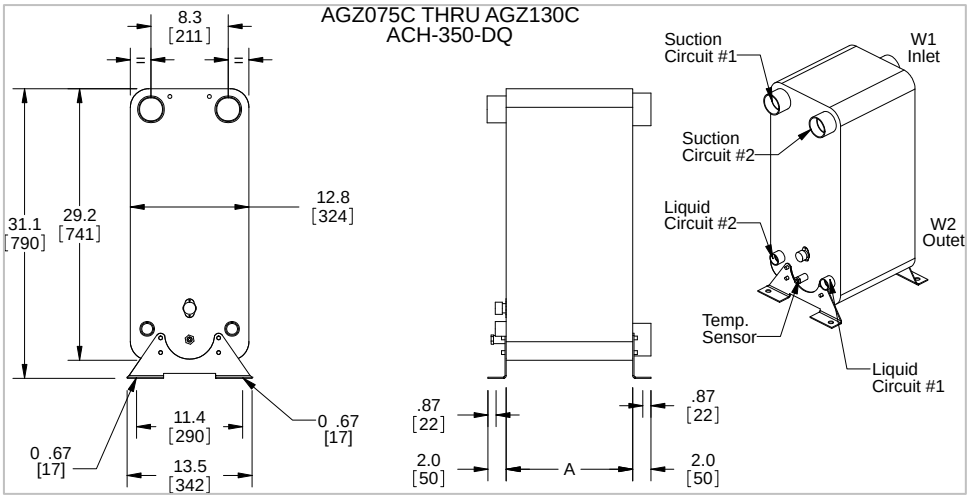
# Remote Evaporators

### *Figure 36, Remote Evaporators, AGZ 030CB - 130CB*

**NOTE**: See following page for additional dimensions, including “A” dimensions**.**



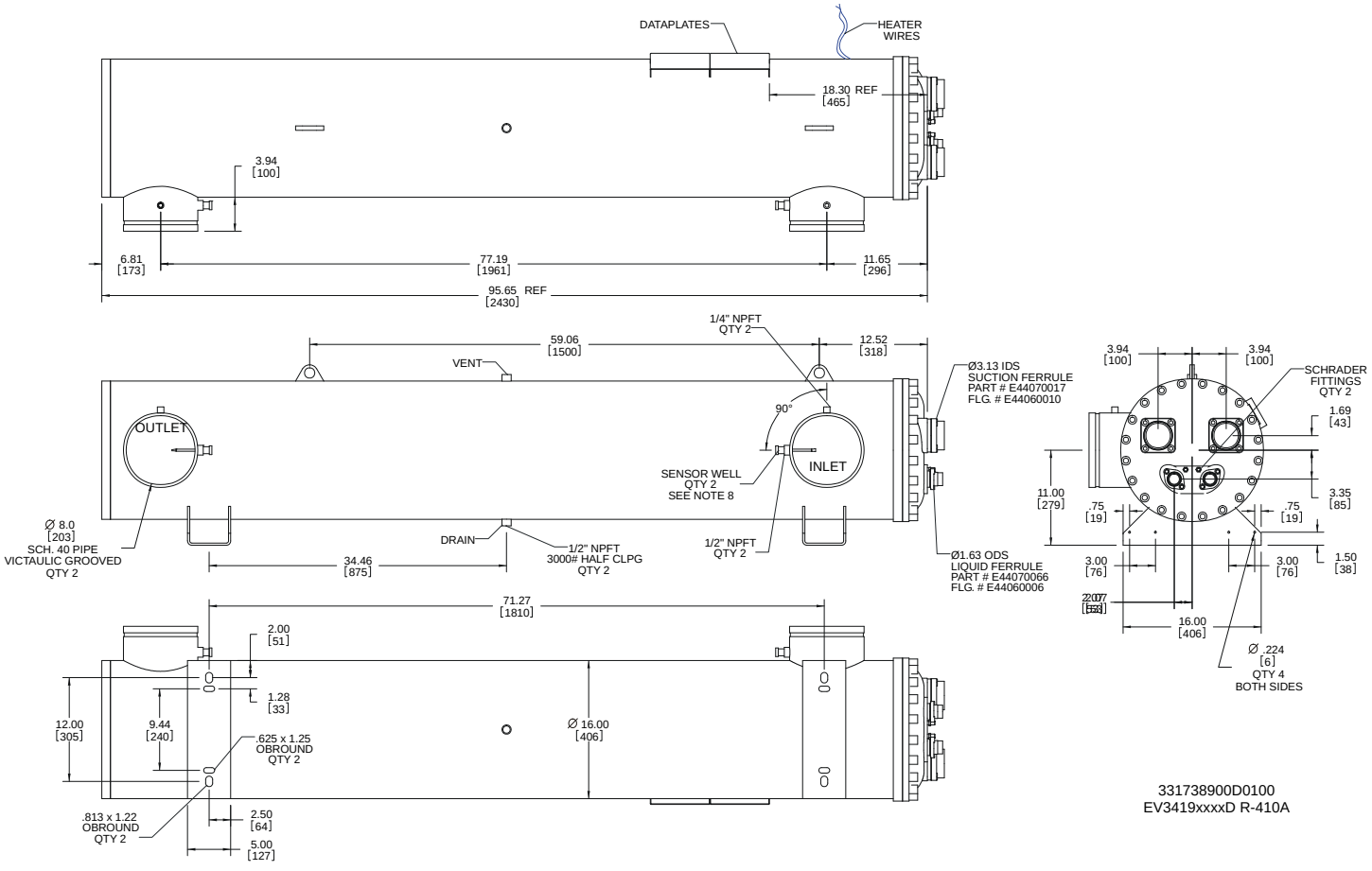



| AGZ-C Model | 030 | 035 | 040 | 045 | 050 | 055 | 060 | 065 |
|---|---|---|---|---|---|---|---|---|
| Suction x 2 | 1.625 | 1.625 | 1.625 | 1.625 | 1.625 | 1.625 | 2.125 | 2.125 |
| Liquid x 2 | 1.125 | 1.125 | 1.125 | 1.125 | 1.125 | 1.125 | 1.375 | 1.375 |
| Water, In & Out | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3.0 | 3.0 |
| Dimension "A" | 8.1 | 9.3 | 10.4 | 12.3 | 14.0 | 15.7 | 12.2 | 14.1 |

| AGZ-C Model | 070 | 075 | 080 | 090 | 100 | 110 | 125 | 130 |
|---|---|---|---|---|---|---|---|---|
| Suction x 2 | 2.125 | 2.625 | 2.625 | 2.625 | 2.625 | 2.625 | 2.625 | 2.625 |
| Liquid x 2 | 1.375 | 1.375 | 1.375 | 1.375 | 1.375 | 1.375 | 1.375 | 1.375 |
| Water, In & Out | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Dimension "A" | 14.1 | 13.8 | 14.5 | 16.3 | 17.4 | 18.5 | 20.7 | 23.8 |

***Figure 37, Remote Evaporators, AGZ 140CB - 190CB***



# Startup

## Pre Start-up

The chiller must be inspected to ensure no components became loose or damaged during shipping or installation.

## Start-Up

Refer to the MicroTech II Controller information in the operating manual OM AGZ-1 to become familiar with unit operation before starting the chiller.

There should be adequate building load (at least 50 percent of the unit full load capacity) to properly check the operation of the chiller refrigerant circuits.

Be prepared to record all operating parameters required by the "Compressorized Equipment Warranty Form". Return this information within 10 working days to McQuay International as instructed on the form to obtain full warranty benefits.

**Start-Up Steps**

- Verify chilled water flow.
- Verify remote start / stop or time clock (if installed) has requested the chiller to start.
- Set the chilled water setpoint to the required temperature. (The system water temperature must be greater than the total of the leaving water temperature setpoint plus one-half the control band plus the start-up delta-T before the MicroTech II controller will stage on cooling.)
- Set the Evap Delta T based on a percent of unit nominal flow indicated in Table 16 and the Start Delta T as a starting point. Delta-T=Tons x 24 / gpm
- Check the controller setpoints to be sure that factory defaults are appropriate.
- Put both pumpdown switches (PS1 and PS2) to the ON position.
- Put system switch (S1) to ON position

| Switch | Switch Position | |
|---|---|---|
| | ON | OFF |
| PS1, PS2, Pumpdown Switches | Circuits will operate in the normal automatic mode | Circuit will go through the normal pumpdown cycle and shut off. |
| S1, System Switch | Unit will operate in the normal automatic mode | Unit will shut off immediately without pumping down (emergency stop) |

There may be a delay of 30 minutes after closing S1. The time delay is due to the compressor inherent motor protection or the Stage Up Timer counting. This should only occur on initial start-up or when power to the chiller has been turned off and back on. More than one compressor will not start at the same time.

After the chiller has been operating for a period of time and has become stable, check the following:

- Compressor oil level. (Some scroll compressors do not have oil sight glasses.)
- Refrigerant sight glass for flashing
- Rotation of condenser fans
- Complete the "Compressorized Equipment Warranty Form"

# Shutdown

## Temporary

1. Put both circuit switches to the OFF position (Pumpdown and Stop).
2. After compressors have stopped, put System Switch (S1) to OFF (emergency stop).
3. Turn off chilled water pump. Chilled water pump to operate while compressors are pumping down.

To start the chiller after a temporary shutdown, follow the start-up instructions.

## Extended

1. Front seat both condenser liquid line service valves.
2. Put both circuit switches to the OFF position (Pumpdown and Stop position).
3. After the compressors have stopped, put System Switch (S1) to the OFF position (emergency stop).
4. Front seat both refrigerant circuit discharge valves (if applicable).
5. If chilled water system is not drained, maintain power to the evaporator heater to prevent freezing. Maintain heat tracing on the chilled water lines.
6. Drain evaporator and water piping to prevent freezing.
7. If electrical power to the unit is on, the compressor crankcase heaters will keep the liquid refrigerant out of the compressor oil. This will minimize start-up time when putting the unit back into service. The evaporator heater will be able to function.
8. If electrical power is off, make provisions to power the evaporator heater (if chilled water system is not drained). Tag all opened electrical disconnect switches to warn against start-up before the refrigerant valves are in the correct operating position. At start-up, electrical power must be on for 24 hours before starting the chiller.

To start the chiller after an extended shutdown, follow the prestart-up and start-up instructions.

# Water Piping Checkout

1. Check the pump operation and vent all air from the system.
2. Circulate evaporator water, checking for proper system pressure and evaporator pressure drop. Compare the pressure drop to the evaporator water pressure drop curve.
3. Clean all water strainers before placing the chiller into service.

# Refrigerant Piping Checkout

1. Check all exposed brazed joints for evidence of leaks. Joints may have been damaged during shipping or when the unit was installed.
2. Check that all refrigerant valves are either opened or closed as required for proper operation of the chiller.
3. A thorough leak test must be done using an approved electronic leak detector. Check all valve stem packing for leaks. Replace all refrigerant valve caps and tighten.
4. Check all refrigerant lines to insure that they will not vibrate against each other or against other chiller components and are properly supported.
5. Check all flare connections and all refrigerant threaded connectors.
6. Look for any signs of refrigerant leaks around the condenser coils and for damage during shipping or installation.
7. Leak detector is applied externally to refrigerant joints at the factory. Do not confuse this residue with an oil leak.
8. Connect refrigerant service gauges to each refrigerant circuit before starting unit.

# Electrical Check Out

**⚠ WARNING**

Electrical power must be applied to the compressor crankcase heaters 24 hours before starting unit to eliminate refrigerant from the oil.

1. Open all electrical disconnects and check all power wiring connections. Start at the power block and check all connections through all components to and including the compressor terminals. These should be checked again after 3 months of operation and at least yearly thereafter.
2. Check all control wiring by pulling on the wire at the spade connections and tighten all screw connections. Check plug-in relays for proper seating and to insure retaining clips are installed.
3. Put System Switch (S1) to the Emergency Stop position.
4. Put both circuit #1 & #2 switches to the Pumpdown and Stop position.
5. Apply power to the unit. The panel Alarm Light will stay on until S1 is closed. Ignore the Alarm Light for the check out period. If you have the optional Alarm Bell, you may wish to disconnect it.
6. Check at the power block or disconnect for the proper voltage and proper voltage between phases. Check power for proper phasing using a phase sequence meter before starting unit.
7. Check for 120 Vac at the optional control transformer and at TB-2 terminal #1 and the neutral block (NB).
8. Check between TB-2 terminal #7 and NB for 120 Vac supply for transformer #2.
9. Check between TB-2 terminal #2 and NB for 120 Vac control voltage. This supplies the compressor crank case heaters.
10. Check between TB-3 terminal #17 and #27 for 24 Vac control voltage.

# Component Operation

## Hot Gas Bypass (Optional)

This option allows the system to operate at lower loads without excessive on/off compressor cycling. The hot gas bypass option is required to be on both refrigerant circuits because of the lead / lag feature of the controller.

This option allows passage of discharge gas into the evaporator inlet (between the TX valve and the evaporator) which generates a false load to supplement the actual chilled water or air handler load.

**Note:** The hot gas bypass valve will not generate a 100% false load.

The pressure regulating valve is a Sporlan HGBE-8 and factory set to begin opening at 102 psig with R-410a and can be changed by changing the pressure setting. The adjustment range is 75 to 150 psig. To raise the pressure setting, remove the cap on the bulb and turn the adjustment screw clockwise. To lower the setting, turn the screw counterclockwise. Do not force the adjustment beyond the range it is designed for, as this will damage the adjustment assembly. The regulating valve opening point can be determined by slowly reducing the system load while observing the suction pressure. When the bypass valve starts to open, the refrigerant line on the evaporator side of the valve will begin to feel warm to the touch.

The bypass valve includes a solenoid valve that is controlled by the MicroTech II controller. It is active when the first stage of cooling on a circuit is active.

**⚠ WARNING**

The hot gas line may become hot enough to cause injury. Be careful during valve checkout.

## VFD Low Ambient Control (Optional)

The optional VFD fan control is used for unit operation below 35°F (2°C) down to a minimum of 0°F (-17°C). The control looks at the saturated discharge temperature and varies the fan speed to hold the temperature (pressure) at the "target" temperature. This temperature is established as an input to a setpoint screen labeled "Sat Condenser Temp Target".

## Filter-Driers

Each refrigerant circuit is furnished with a full flow filter drier (AGZ 030 – 070) or a replaceable core type filter-drier (AGZ 075-180). The core assembly of the replaceable core drier consists of a filter core held tightly in the shell in a manner that allows full flow without bypass.

Pressure drop across the filter drier at full load conditions must not exceed 10 psig at full load. See page 87 for maximum pressure drop at other load points. Replace the filter drier if the pressure drop exceeds maximum.

**⚠ WARNING**

Pump out refrigerant before removing end flange for replacement of core(s) to remove liquid refrigerant and lower pressure to prevent accidental blow off of flange cover.
EPA recovery regulations apply to this procedure.

A condenser liquid line service valve is provided for isolating the charge in the condenser, but also serves as the point from which the liquid line can be pumped out. With the line free of refrigerant, the filter-drier core(s) can be easily replaced.

## System Adjustment

To maintain peak performance at full load operation, the system superheat and liquid subcooling may require adjustment. Read the following subsections closely to determine if adjustment is required.

## Liquid Line Sight Glass

The color of the moisture indicator is an indication of the dryness of the system and is extremely important when the system has been serviced. Immediately after the system has been opened for service, the element may indicate a wet condition. It is recommended that the equipment operate for approximately 12 hours to allow the system to reach equilibrium before deciding if the system requires a change of drier cores.

Bubbles in the sight glass at constant full load indicates a shortage of refrigerant, a plugged filter-drier, or a restriction in the liquid line. However, it is not unusual to see bubbles in the sight glass during changing load conditions.

## Thermostatic Expansion Valve

The expansion valve performs one specific function. It keeps the evaporator supplied with the proper amount of refrigerant to satisfy the load conditions.

The sensing bulb of the expansion valve is installed in the closest straight run of suction line from the evaporator. The bulb is held on by clamps around the suction line and is insulated to reduce the effect of surrounding ambient temperatures. In case the bulb must be removed, simply slit the insulation on each side of the bulb, remove the clamps and then remove the capillary tubing that runs along the suction line from the valve. The power element is removable from the valve body.

**NOTE**: Before adjusting superheat, check that unit charge is correct and liquid line sight glass is full with no bubbles and that the circuit is operating under stable, full load conditions.

The suction superheat for the suction leaving the evaporator is set at the factory for 8 to 12 degrees F at full load. To have full rated unit performance, the superheat must be about 8 degrees F at 95°F outdoor ambient temperature.

## Crankcase Heaters

The scroll compressors are equipped with externally mounted band heaters located at the oil sump level. The function of the heater is to keep the temperature in the crankcase high enough to prevent refrigerant from migrating to the crankcase and condensing in the oil during off-cycle.

Power must be supplied to the heaters 24 hours before starting the compressors.

## Evaporator

On models AGZ-030C through -130C, the evaporator is a compact, high efficiency, single or dual circuit, brazed plate-to-plate type heat exchanger consisting of parallel stainless steel plates. The evaporator is protected with an electric resistance heater and insulated with 3/4" (19mm) thick closed-cell polyurethane insulation. This combination provides freeze protection down to -20°F (-29°C) ambient air temperature. The water side working pressure of the brazed plate type of evaporator is 653 psig (4502 kPa). Evaporators are designed and constructed according to, and listed by, Underwriters Laboratories (UL).

On models AGZ-140C through -180C, the evaporator is a direct-expansion, shell-and-tube type with water flowing in the baffled shell side, and refrigerant flowing through the tubes. The evaporator is wrapped with an electric resistance heater cable and insulated with 3/4" (19 mm) thick vinyl nitrate polymer sheet insulation, protecting against water freeze-up at ambient air temperatures to -20° F (-29° C). An ambient air thermostat controls the heater cable. The fitted and glued-in-place insulation has a K factor of 0.28 Btu in/hr $ft^2$ $^oF$ at 75°F. The water side working pressure of the shell-and-tube type of evaporator is 152 psig (1048 kPa). Each evaporator is designed, constructed, inspected, and stamped according to the requirements of the ASME Boiler and Pressure Vessel Code. Double thickness insulation is available as an option.

## Phase Voltage Monitor (Optional)

Factory settings are as follows:

- Trip Delay Time, 2 seconds.
- Voltage Setting, set at nameplate voltage.
- Restart Delay Time, 60 seconds.

# Unit Maintenance

## General

On initial start-up and periodically during operation, it will be necessary to perform certain routine service checks. Among these are checking the liquid line sight glasses, taking condensing and suction pressure readings, and checking to see that the unit has normal superheat and subcooling readings. A recommended maintenance schedule is located at the end of this section.

## Compressor Maintenance

The scroll compressors are fully hermetic and require no maintenance other than checking oil level.

## Lubrication

No routine lubrication is required on AGZ units. The fan motor bearings are permanently lubricated and no further lubrication is required. Excessive fan motor bearing noise is an indication of a potential bearing failure.

The compressors in this unit use POE lubricant. POE lubricant is required with refrigerant R-410A. Do not use mineral oil.

## Electrical Terminals

**⚠ DANGER**

Electric shock hazard. Turn off all power before continuing with following service.

## Condensers

The condensers are air-cooled and constructed of 3/8" (9.5mm) O.D. internally finned copper tubes bonded in a staggered pattern into louvered aluminum fins. Maintenance consists primarily of the routine removal of dirt and debris from the outside surface of the fins and repairing any fin damage. McQuay recommends the use of foaming coil cleaners available at most air conditioning supply outlets. Use caution when applying such cleaners as they can contain potentially harmful chemicals. Care should be taken not to damage the fins during cleaning. The coils should be thoroughly rinsed to remove any cleaner residue.

If the service technician determines that the refrigerant circuit contains noncondensables, recovery can be required, strictly following Clean Air Act regulations governing refrigerant discharge to the atmosphere. The Schrader purge valve is located on the vertical coil headers on both sides of the unit at the end opposite the control box. Decorative panels cover the condenser coils and must be removed for servicing. Recover with the unit off, after a shutdown of 15 minutes or longer, to allow air to collect at the top of the coil. Restart and run the unit for a brief period. If necessary, shut the unit off and repeat the procedure. Follow national and local regulations regarding refrigerant venting and reclamation when removing refrigerant from the unit.

## Optional High Ambient Control Panel

Consists of exhaust fan with rain hood, two inlet screens with filters, necessary controls and wiring to allow operation to 125°F (52°C). The option can be factory or field installed as a kit.

- It must be supplied on units operating at ambient temperatures of 105°F (40.6°C) and above.
- It is automatically included on units with fan VFD (low ambient option).
- Check inlet filters periodically and clean as required. Verify that the fan is operational.

### Liquid Line Sight Glass

The refrigerant sight glasses should be observed periodically. (A weekly observation should be adequate.) A clear glass of liquid indicates that there is subcooled refrigerant charge in the system. Bubbling refrigerant in the sight glass, during stable run conditions, indicates that the system can be short of refrigerant charge. Refrigerant gas flashing in the sight glass could also indicate an excessive pressure drop in the liquid line, possibly due to a clogged filter-drier or a restriction elsewhere in the liquid line.

See Table 36 on page 87 for maximum allowable pressure drops. If subcooling is low, add charge to clear the sight glass. If subcooling is normal (15 to 20 degrees F) and flashing is visible in the sight glass, check the pressure drop across the filter-drier. Subcooling should be checked at full load with 70°F (21.1°C) outdoor air temperature, stable conditions, and all fans running.

An element inside the sight glass indicates the moisture condition corresponding to a given element color. If the sight glass does not indicate a dry condition after about 12 hours of operation, the circuit should be pumped down and the filter-drier changed or verify moisture content by performing an acid test on the compressor oil.

## Preventive Maintenance Schedule

| OPERATION | WEEKLY | MONTHLY (Note 1) | ANNUAL (Note 2) |
|---|---|---|---|
| General | | | |
| Complete unit log and review (Note 3) | X | | |
| Visually inspect unit for loose or damaged components | | X | |
| Inspect thermal insulation for integrity | | | X |
| Clean and paint as required | | | X |
| | | | |
| Electrical | | | |
| Check terminals for tightness, tighten as necessary | | | X |
| Clean control panel interior | | | X |
| Visually inspect components for signs of overheating | | X | |
| Verify compressor heater operation | | X | |
| Test and calibrate equipment protection and operating controls | | | X |
| Megger compressor motor * | | | X |
| | | | |
| Refrigeration | | | |
| Leak test | | X | |
| Check sight glasses for clear flow | X | | |
| Check filter-drier pressure drop (see manual for spec) | | X | |
| Perform compressor vibration test | | | X |
| Acid test oil sample | | | X |
| | | | |
| Condenser (air-cooled) | | | |
| Clean condenser coils (Note 4) | | | X |
| Check fan blades for tightness on shaft (Note 5) | | | X |
| Check fans for loose rivets and cracks | | | X |
| Check coil fins for damage | | | X |

**Notes:**

1. Monthly operations include all weekly operations.
2. Annual (or spring start-up) operations includes all weekly and monthly operations.
3. Log readings can be taken daily for a higher level of unit observation.
4. Coil cleaning can be required more frequently in areas with a high level of airborne particles.
5. Be sure fan motors are electrically locked out.

* Never Megger motors while they are in a vacuum to avoid damage to the motor.

# Service

## R-410A

### General

R-410A was developed as an alternative refrigerant for HCFC R-22 in newly designed positive displacement, direct expansion systems.

It is a binary mix of HFC-32 (difluoromethane CH2F2) & HFC-125 (pentafluoroethane CHF2CF3), in the ratio of 50/50 %wt. It is azeotropic but has less than 1 degree F glide over the typical a/c range of operation. There is no need for dew and bubble point corrections.

Trade names include: Suva 9100 by DuPont, Genetron AZ-20 by Honeywell, Puron by Carrier, Forane 410A by Atofina, Klea 410A by ICI.

The following functions, conditions and settings will differ from units charged with R-22.

1. Different physical data and electrical data
2. Polyolester lubricants are used instead of mineral oil
3. The saturated pressure/temperature relationship
4. Control and alarm settings
5. Charging procedures

### Refrigerant Terminology

**Bubble Point:** The temperature/pressure where bubbles first appear when heat is added to a liquid refrigerant. Used to measure sub-cooling.

**Dew Point:** The temperature/pressure where droplets first appear when heat is removed from a refrigerant gas. Used to measure superheat.

**Fractionalization:** A change in refrigerant composition due to the tendency of the higher pressure refrigerant to leak at a faster rate, should a system have leakage from a static two-phase region.

**Glide:** The total difference of Dew and Bubble Point at a specific condition. Mid-Point or Mean: Measurement half way between Dew and Bubble Points.

**Miscibility**: The ability of a refrigerant and oil to mix and flow together.

**Solubility**: The effect of refrigerant on the viscosity of a lubricant.

### Safety

Comparable to R-22; ANSI/ASHRAE  safety group A1.

Always carry and be familiar with MSDS information for R-410a.

Store refrigerant in clean, dry area out of direct sunlight.

Never heat or store cylinders above 125° F. Note vehicle precautions!

Never tamper with cylinder valves or pressure relief valves. (Typical relief for R-410A is 525 psig).

Never refill disposable cylinders.

Verify cylinder hook-up.

Verify cylinder label and color code match. R-410A is rose/light maroon. Must be DOT approved, R-410A with 400 psig rating. Open cylinders slowly.

Avoid rough handling of cylinders and secure as appropriate. Cap when not in use.

Do not overfill recovery cylinders or overcharge units.

Check gauge calibration before every use and manifold set for leaks regularly.

Be aware of pneumatic and possible hydrostatic pressure potentials.

Never pressurize systems with oxygen or ref/air mix. R-410A, R-407C, R-134A, & R-22 are flammable with low air mix.

Wear protective clothing. Impervious gloves and splash goggles should be worn.

Avoid contact with liquid refrigerant (R-410A -60.8°F @ atms.) due to corrosion and freezing hazards.

Avoid exposure to vapors. 1000 ppm/8 hr.

Evacuate areas in cases of large releases. R-410A is heavier than air and can cause asphyxiation, narcotic and cardiac sensation effects.

Evacuate systems and break vacuum (0 psig) with nitrogen before welding or brazing.

Always ventilate work areas before using open flames. Exposure to open flames or glowing metal will form toxic hydrofluoric acid & carbonyl fluoride. No smoking!

Make sure all tools, equipment, and replacement components are rated for the refrigerant used.

## Lubrication

POE oil is extremely hydroscopic, is polar in nature (picks up dirt, etc.), and will hydrolyze (produce acids) in the presence of water.

Use only the manufacturer's recommended oil.

Use only new sealed metal containers of oil to insure quality.

Buy smaller containers to prevent waste and contamination.

Use only filter driers designed for POE and check pressure drops frequently.

Test for acid and color at least annually. Change filter driers if acid or high moisture (> 200 ppm) is indicated (< 100 ppm typical).

Do not use oil additives or refrigerant additives.

Evacuate to 500 microns and hold test to insure systems are dry.

The units are factory-charged with lubricant and one of the following lubricants must be used if lubricant is to be added to the system:

- Copeland Ultra 22 CC
- Mobil EAL™ Arctic 22 CC
- ICI EMKARATE RL RL™ 32CF

Since POEs are very hygroscopic, they will quickly absorb moisture if exposed to air. Pump the lubricant into the unit through a closed transfer system. Avoid overcharging the unit.

### Control and Alarm Settings

The software that controls the operation of the unit is factory-set for operation with R-410A, taking into account that the pressure/temperature relationship differs from R-22. The software functionality is the same for either refrigerant.

### Charging

To prevent fractionalization, liquid must be charged from the refrigerant cylinder, unless charging the entire cylinder contents.

Charging or check valves should always be used on charging hoses to limit refrigerant loss and prevent frostbite. Ball valve type recommended.

Charge to 80-85% of normal charge before starting the compressors.

**Charging procedure.** The units are factory-charged with R-410A. Use the following procedure if recharging in the field is necessary:

Whether topping off a charge or replacing the circuit's entire charge, always remove the refrigerant from the charging vessel as a liquid. Many of the cylinders for the newer refrigerants have a dip tube so that liquid is drawn off when the cylinder is in the upright position. Do not vapor charge out of a cylinder unless the entire contents will be charged into the system.

With the system in a 250-micron or lower vacuum, liquid can be charged into the high side. Initially charge about 80 percent of the system total charge.

Use a refrigerant flow restrictor if charging liquid to suction or a system at pressure below a saturated temperature less than 32°F.

Start the system and observe operation. Once operating, trim the charge to the recommended liquid line sub-cooling (approximately 10-15 degrees F typical) and verify the suction superheat (8-10 degrees F typical, about 2-4 degrees less than R-22) at full load conditions Use standard charging procedures (liquid only) to top off the charge.

It may be necessary to add refrigerant through the compressor suction. Because the refrigerant leaving the cylinder must be a liquid, exercise care to avoid damage to the compressor. A sight glass can be connected between the charging hose and the compressor. It can be adjusted to have liquid leave the cylinder and vapor enter the compressor.

## Service Issues

With R-410A, fractionalization, if due to leaks and recharge has a minimal effect on performance or operation.

Special tools will be required due to higher refrigerant pressures with R-410A. Oil-less/hp recovery units, hp recovery cylinders (DOT approved w/525# relief), gauge manifold 30"-250 psi low/0-800 psi high, hoses w/800 psi working & 4,000 psi burst.

All filter driers and replacement components must be rated POE oils and for the refrigerant pressure (R-410A 600psig typical).

R-410A compressor internal relief is 600-650 psid.

Brazed connections only. No StayBrite or solder connections (solder should never be used with any refrigerant). K or L type refrigeration tubing only. Use nitrogen purge. Higher R-410A pressures and smaller molecule size make workmanship more critical.

R-410A must be charged from cylinder as a liquid unless entire cylinder is used. Use a refrigerant flow restrictor if charging liquid to suction or to a system at pressure below a saturated temperature of 32° F.

EPA recovery and handling requirements for R-410A are the same as R-22.

Cooling the recovery cylinder will speed recovery and lessen stress on recovery equipment.

**⚠ WARNING**

Service on this equipment is to be performed by qualified refrigeration personnel familiar with equipment operation, maintenance, correct servicing procedures, and the safety hazards inherent in this work. Causes for repeated tripping of equipment protection controls must be investigated and corrected.

Disconnect all power before doing any service inside the unit.

Anyone servicing this equipment must comply with the requirements set forth by the EPA in regards to refrigerant reclamation and venting.

### Filter-Driers

A replacement of the filter-drier is recommended any time excessive pressure drop is read across the filter-drier and/or when bubbles occur in the sight glass with normal subcooling. The maximum recommended pressure drops across the filter-drier are as follows:

***Table 36, Filter-Drier Pressure Drop***

| PERCENT CIRCUIT LOADING (%) | MAXIMUM RECOMMENDED PRESSURE DROP ACROSS FILTER DRIER PSIG (KPA) |
|---|---|
| 100% | 10 (69) |
| 75% | 8 (55.2) |
| 50% | 5 (34.5) |
| 25% | 4 (27.6) |

The filter-drier should also be changed if the moisture indicating liquid line sight glass indicates excess moisture in the system.

During the first few months of operation the filter-drier replacement can be necessary if the pressure drop across the filter-drier exceeds the values listed in the paragraph above. Any residual particles from the condenser tubing, compressor and miscellaneous components are swept by the refrigerant into the liquid line and are caught by the filter-drier.

## Liquid Line Solenoid Valve

The liquid line solenoid valves that shut off refrigerant flow in the event of a power failure do not normally require any maintenance. The solenoids can, however, require replacement of the solenoid coil or of the entire valve assembly.

The solenoid coil can be checked to see that the stem is magnetized when energized by touching a screwdriver to the top of the stem. If there is no magnetization, either the coil is bad or there is no power to the coil.

The solenoid coil can be removed from the valve body without opening the refrigerant piping after pumpdown. For personal safety, shut off and lock out the unit power.

The coil can then be removed from the valve body by simply removing a nut or snap-ring located at the top of the coil. The coil can then be slipped off its mounting stud for replacement.

To replace the entire solenoid valve follow the steps involved when changing a filter-drier.

## Evaporator

The evaporators on AGZ-C models 030 - 130 are brazed plate type, and on models 140, 160, and 180 they are shell-and-tube type. Other than cleaning and testing, no service work should be required on the evaporator.

## Refrigerant Charging

The AGZ units have a condenser coil design with approximately 15% of the coil tubes located in a subcooler section of the coil to achieve liquid cooling to within 5°F (3°C) of the outdoor air temperature when all condenser fans are operating. This is equal to 15°F to 20°F (8.3°C to 11.1°C) subcooling below the saturated condensing temperature when the pressure is read at the liquid valve between the condenser coil and the liquid line filter-drier. Once the subcooler is filled, extra charge will not lower the liquid temperature and does not help system capacity or efficiency.

**One of the following three scenarios will be experienced with an undercharged unit:**

1. If the unit is slightly undercharged, the unit may show bubbles in the sight glass. Recharge the unit as described in the charging procedure below.

2. If the unit is moderately undercharged, it may trip on freeze protection. Recharge the unit as described in the charging procedure below. However, freezestat trips can also be an indication of low flow or poor heat transfer due to tube fouling. Anti-freeze solutions can also cause freezestat trips if the controls are not set properly.

3. If the unit is severely undercharged, the unit will trip on low pressure due to lack of liquid flow to the expansion valve. In this case, either remove the remaining charge by means of a proper reclamation system and recharge the unit with the proper amount of refrigerant as stamped on the unit nameplate, or add refrigerant through the suction valve on the compressor with the compressor running (using proper method of liquid charging). If the unit is severely undercharged, the unit can nuisance trip during this charging procedure. If this happens, operate the unit at minimum load, adding charge until the sight glass is clear. Once the unit has enough charge so that it does not trip out, continue with Step 2 of the charging procedure below.

**Procedure to charge a moderately undercharged AGZ unit:**

1. If a unit is low on refrigerant, you must first determine the cause before attempting to recharge the unit. Locate and repair any refrigerant leak. Evidence of oil is a good indicator of leakage, however, oil may not be visible at all leaks. Liquid leak detector fluids work well to show bubbles at medium size leaks but electronic leak detectors can be needed to locate small leaks.

2. Add the charge to the system through the suction shutoff valve or through the Schrader fitting on the tube entering the evaporator between the compressor and the evaporator head.

3. The charge can be added at any load condition between 25 to 100 percent load per circuit, but at least two fans per refrigerant circuit should be operating if possible. The suction superheat should be in the 8 to 12 degree F (4.4°C-6.6°C) range.

4. Add sufficient charge to clear the liquid line sight glass and until all flashing stops in the sight glass.

5. Check the unit subcooling value by reading the liquid line pressure and temperature at the liquid line near the filter-drier. The subcooling values should be between 15 and 20 degrees F (8.3 and 11.1 degrees C).

6. With outdoor temperatures above 60°F (15.6°C), all condenser fans should be operating and the liquid line temperature should be within 5°F to 10°F (2.8°C to 5.6°C) of the outdoor air temperature. At 25-50% load, the liquid line temperature should be within 5°F (2.8°C) of outdoor air temperature with all fans on. At 75-100% load the liquid line temperature should be within 10°F (5.6°C) of outdoor air temperature with all fans on.

7. Overcharging of refrigerant will raise the compressor discharge pressure due to filling of the condenser tubes with excess refrigerant.

# AGZ Troubleshooting Chart

| PROBLEM | POSSIBLE CAUSES | POSSIBLE CORRECTIVE STEPS |
|---|---|---|
| **Compressor Will Not Run** | 1. Main switch.<br>2. Fuse blown. circuit breakers open<br>3. Thermal overloads tripped<br>4. Defective contactor or coil.<br>5. System shutdown by equipment protection devices<br>6. No cooling required<br>7. Liquid line solenoid will not open<br>8. Motor electrical trouble<br>9. Loose wiring | 1. Close switch.<br>2. Check electrical circuits and motor windings for shorts or grounds. Investigate for possible overloading. Replace fuse or reset breakers after fault is corrected. Check for loose or corroded connections.<br>3. Overloads are auto-reset. Check unit closely when unit comes back on line. Allow time for auto-reset.<br>4. Repair or replace<br>5. Determine type and cause of shutdown and correct it before resetting equipment protection switch.<br>6. None. Wait until unit calls for cooling.<br>7. Repair or replace solenoid coil. Check wiring.<br>8. Check motor for opens, shorts, or burnout.<br>9. Check all wire junctions. Tighten all terminal screws. |
| **Compressor Noisy Or Vibrating** | 1. Low or no refrigerant charge<br>2. Compressor running in reverse<br>3. Improper piping support on suction or discharge<br>4. Worn compressor isolator bushing<br>5. Worn Compressor | 1. Repair and recharge<br>2. Check unit and compressor for correct phasing<br>3. Relocate, add, or remove hangers<br>4. Replace<br>5. Replace |
| **High Discharge Pressure** | 1. Noncondensables in system<br>2. System overcharged with refrigerant<br>3. Optional discharge shutoff valve partially closed<br>4. FanTrol wiring not correct<br>5. Fan not running<br>6. Dirty condenser coil<br>7. Air recirculation | 1. Extract the noncondensables with approved procedures.<br>2. Remove excess, check liquid subcooling.<br>3. Open valve.<br>4. Check FanTrol wiring.<br>5. Check electrical circuit, Check fan motor.<br>6. Clean coil.<br>7. Correct. |
| **Low Discharge Pressure** | 1. Refrigerant flood back<br>2. Wind blowing into coil at low ambient<br>3. Faulty condenser temperature regulation<br>4. Insufficient refrigerant in system<br>5. Low suction pressure<br>6. Only one compressor operating | 1. Correct.<br>2. Shield coil from direct wind, Wind guards are available.<br>3. Check condenser control operation.<br>4. Check for leaks. Repair and add charge.<br>5. See corrective steps for Low Suction Pressure.<br>6. See corrective steps for Compressor Will Not Stage Up. |
| **High Suction Pressure** | 1. Excessive water temperature<br>2. Excessive load<br>3. Expansion valve overfeeding<br>4. Compressors running in reverse | 1. Check control settings.<br>2. Reduce load or add additional equipment.<br>3. Check remote bulb. Regulate superheat.<br>4. Check for proper phasing. |
| **Low Suction Pressure** | 1. Rapid load swings<br>2. Lack of refrigerant<br>3. Clogged liquid line filter drier<br>4. Expansion valve malfunctioning<br>5. Condensing temperature too low<br>6. Compressor will not unload<br>7. Insufficient water flow<br>8. Evaporator head ring gasket slippage<br>9. Evaporator dirty<br>10. Rapid load swings | 1. Stabilize load.<br>2. Check for leaks, repair, add charge. Check liquid sight glass.<br>3. Check pressure drop across filter drier. Replace.<br>4. Check and reset for proper superheat.<br>5. Check means for regulating condenser temperature.<br>6. See corrective steps for Compressor Staging Intervals Too Low.<br>7. Adjust flow.<br>8. Take pressure drop across vessel and contact factory to obtain design pressure drop for that vessel.<br>9. Clean chemically.<br>10. Stabilize load. |
| **Compressor Will** | 1. Defective capacity control | 1. Replace. |

| | | |
|---|---|---|
| **Not Stage Up** | 2. Faulty thermostat stage or broken wire<br>3. Stages not set for application | 2. Replace.<br>3. Reset thermostat setting for application. |
| **Compressor Staging Intervals Too Short** | 1. Thermostat control band not set properly<br>2. Faulty water temperature sensor<br>3. Insufficient water flow<br>4. Rapid load swings | 1. Set control band wider.<br>2. Replace.<br>3. Adjust flow.<br>4. Stabilize load. |

| PROBLEM | POSSIBLE CAUSES | POSSIBLE CORRECTIVE STEPS |
|---|---|---|
| **Compressor Oil Level Too High Or Too Low** | 1. Oil hang-up in piping<br>2. Low oil level<br>3. Loose fitting on oil line<br>4. Level too high<br>5. Insufficient water flow - Level too high<br>6. Excessive liquid in crankcase - Level too high<br>7. Short cycling | 1. Review refrigerant piping and correct.<br>2. Check and add oil.<br>3. Check and tighten system.<br>4. Adjust thermal expansion valve.<br>5. Adjust flow.<br>6. Check crankcase heater. Reset expansion valve for higher superheat. Check liquid line solenoid valve operation.<br>7. Stabilize load or increase staging interval. |
| **Compressor Loses Oil** | 1. Lack of refrigerant<br>2. Suction superheat too high<br>3. Crankcase heater burnout | 1. Check for leaks and repair. Add refrigerant<br>2. Adjust superheat.<br>3. Replace crankcase heater. |
| **Motor Overload Relays or Circuit Breakers Open** | 1. Low voltage during high load conditions<br>2. Defective or grounded wiring in motor<br>3. Loose power wiring or burnt contactors<br>4. High condenser temperature<br>5. Power line fault causing unbalanced voltage | 1. Check supply voltage for excessive line drop.<br>2. Replace compressor motor.<br>3. Check all connections and tighten.<br>4. See corrective steps for High Discharge Pressure.<br>5. Check supply voltage. Notify power company. Do not start until fault is corrected.. |
| **Compressor Thermal Protection Switch Open** | 1. Operating beyond design conditions<br>2. Discharge valve partially shut<br>3. Blown compressor internal gasket<br>4. Voltage range or imbalance<br>5. High superheat<br>6. Compressor bearing failure | 1. Add facilities so conditions are within allowable limits.<br>2. Open valve.<br>3. Replace gasket.<br>4. Check and correct.<br>5. Adjust to correct superheat.<br>6. Replace compressor . |

# Warranty Statement

## Limited Warranty

All McQuay equipment is sold pursuant to McQuay Standard Terms and Conditions of Sale and Limited Product Warranty. Consult your local McQuay Representative for warranty details. Refer to form 933-430285Y-00-A (09/08). To find your local representative, go to www.mcquay.com

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to **www.mcquay.com.**

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